

ENVIRON

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December 22, 2000

Mr. Michael McAteer
USEPA, HSRW-6J
77 West Jackson Blvd.
Chicago, IL 60604-3590

Re: Background Surface and Subsurface Water Monitoring Report
ECC Superfund Site
Zionsville, Indiana

Dear Mr. McAteer:

This letter report presents the results of the background surface and subsurface water monitoring at the ECC Superfund Site in Zionsville, Indiana.

A. Applicable Subsurface Water Background Concentrations

Footnote 2 to Table 3-1 of Revised Exhibit A states: *"In the event that higher concentrations than those set forth for any parameter in this column are present in the upgradient subsurface water in the till and/ or sand and gravel according to the procedure specified below, then those higher upgradient subsurface water concentrations and not the values set forth in this table shall constitute the Acceptable Subsurface Water Concentrations within the meaning of this Exhibit A and the Consent Decree. Those upgradient subsurface water concentrations are referred to in this Exhibit A as "Applicable Subsurface Water Background Concentrations." Twelve subsurface water samples will be taken from existing or new well locations, approved by EPA, over at least a 12-month period in areas upgradient of the site. The exact procedure, location of wells, and schedule for collecting and analyzing the samples will be approved by EPA, after consultation with the state, prior to its implementation. Subsurface samples for inorganics and PCB analysis will be filtered. For each parameter, the analytical results from the 12 samples will be analyzed using standard statistical procedures. The mean and standard deviation will be calculated, and all nondetects will be assigned a value equal to 1/2 the EPA-approved quantification limit. For purposes of this Document, "Applicable Subsurface Water Background Concentrations" is defined as two (2) standard deviations above the calculated mean of these 12 samples."*

1. Subsurface Water Sampling

Subsurface water samples were collected as described in Section 6.3 of the Revised Remedial Action Field Sampling Plan (FSP), Revision 4 dated April 28, 1998 (Appendix A) with the alterations described in the April 16, 1999 Background Surface and Subsurface Water Monitoring Report. The applicable subsurface water background samples were collected from T-5 (for till subsurface water) and S-1 (for sand and gravel subsurface

water). The background well locations are shown on Figure 1. The subsurface water samples were collected from August 1998 to July 1999.

Field measurements such as pH, temperature, specific conductivity, and dissolved oxygen as well as other information recorded during well purging and sampling are provided in Appendix B.

2. Subsurface Water Sample Analysis

Following the sample collection, the samples were placed in ice filled coolers. At the end of each day, the sample coolers were shipped directly to the laboratory. Appropriate chain-of-custody protocols were followed throughout sample handling. CompuChem, A Division of Liberty Analytical Corporation (CompuChem) of Cary, North Carolina provided the analytical services for all the sampling events with the exception of the August, September and October 1998 events. The analytical services for the August, September and October 1998 sampling events were provided by Core Laboratories of Valparaiso, Indiana.

Subsurface water samples were analyzed for the parameters listed in Table 3-1 of Revised Exhibit A in accordance with the analytical methods summarized in Table 7-1 of the FSP (Appendix A). Analytical results for the samples collected from monitoring well T-5 are presented in Table 1 and analytical results for the samples collected from monitoring well S-1 are presented in Table 2.

3. Subsurface Water Quality Assurance and Quality Control Samples

To monitor the effectiveness of decontamination procedures, ENVIRON collected at least one field blank per subsurface water sampling event by pouring deionized water through a decontaminated Teflon bailer into a sample container or by pumping deionized water through a peristaltic pump and tubing into a sample container. For the metals and PCB, samples, the field blank water was also passed through a 0.45-micron filter. The laboratory supplied trip blanks to monitor possible contamination from sample handling, transport, and storage. The trip blanks accompanied the samples and were analyzed for the volatile organic compounds (VOCs) listed in Table 3-1 of Revised Exhibit A. Appendix C contains the analytical results for the quality assurance and quality control samples collected during the background sampling.

To evaluate the reproducibility of results, ENVIRON collected one duplicate sample for every 10 or fewer subsurface water samples collected during each sampling event. Duplicate subsurface water samples were not collected from the T-5 till well due to the slow recovery and low yield of this well. The duplicate subsurface water samples were collected by pouring the subsurface water from the bailer into two alternating sets of sample containers or, if the pump was used to sample, the water was pumped into two alternating sets of containers. The analytical results for the duplicate samples are included with the sampling results summarized in Table 2.

4. Applicable Subsurface Water Background Concentrations

The Applicable Subsurface Water Background Concentrations were calculated according to Note 2 of Table 3-1 of the Revised Exhibit A. The Applicable Subsurface Water

Background Concentrations are defined as two standard deviations above the calculated mean of the background subsurface water samples. The Applicable Subsurface Water Background Concentrations are presented in Table 3.

Organic results flagged with a B qualifier, indicating that the compound was detected within the laboratories method blank, were disregarded and half of the EPA-approved quantification limit¹ was used in its place. The results from the duplicate subsurface water samples were included in the background subsurface water sample results.

B. Applicable Surface Water Background Concentrations

Footnote 4 to Table 3-1 of Revised Exhibit A states: *"In the event that higher concentrations than those set forth for any parameter in this column are present in the upstream surface water, then those higher upstream concentrations and not the values set forth in this table shall constitute the Acceptable Stream Concentrations within the meaning of this Exhibit A and the Consent Decree. Those higher upstream surface water concentrations are referred to in this Exhibit A as "Applicable Surface Water Background Concentrations." Twelve surface water samples will be taken from Unnamed Ditch upstream of the site over at least a 12-month period. The exact procedure, location of samples, and schedule for collecting and analyzing the samples will be approved by EPA, after consultation with the state, prior to its implementation. For each parameter, the analytical results from 12 samples will be analyzed using standard statistical procedures. The mean and standard deviation will be calculated, and all nondetects will be assigned a value equal to ½ the EPA-approved quantification limit. For purposes of this document, "Applicable Surface Water Background Concentrations" is defined as two (2) standard deviations above the calculated mean of these 12 samples."*

1. Surface Water Sampling

Surface water samples were collected as described in Section 6.4 of the Revised Remedial Action Field Sampling Plan (FSP), Revision 4 dated April 28, 1998 (Appendix A) with the alterations described in the April 16, 1999 Background Surface and Subsurface Water Monitoring Report. The applicable surface water background samples were collected from SW-1 and were to be collected from NSL-1. Samples were not collected from the NSL-1 location since water was not observed flowing from the North Side Landfill discharge to the Unnamed Ditch during any of the sampling events. The background surface water sample locations are shown on Figure 1.

The surface water samples were collected from November 1998 to March 2000. No surface water samples were collected from the Unnamed Ditch between July 1999 and February 2000, due to the lack of flowing water within the ditch during this period.

Field measurements, stream flow measurements and rain accumulation measurements recorded during the 24-hour and 48-hour period preceding the surface water sampling are provided in Appendix B.

¹ The EPA-approved quantification limits were taken from the USEPA Contract Laboratory Program Statement of Work for Organics Analysis OLM04 2 and the Statement of Work for Inorganic Analysis ILM04 0

According to the Quality Assurance Project Plan, Volume II, Field Sampling Plan, Addendum No.1, Background Sampling of Unnamed Ditch (Addendum No.1 to the FSP) (Appendix A), at least six surface water samples were collected following a storm event.

2. Surface Water Sample Analysis

Following the sample collection, the samples were placed in ice filled coolers. At the end of each day, the sample coolers were shipped directly to the laboratory. Appropriate chain-of-custody protocols were followed throughout sample handling. CompuChem also provided the analytical services for all the surface water-sampling events.

Surface water samples were analyzed for the parameters containing Acceptable Stream Concentrations as listed in Table 3-1 of Revised Exhibit A in accordance with the analytical methods summarized in Table 7-1 of the FSP (Appendix A). The analytical results for the surface water location SW-1 are presented in Table 4.

3. Surface Water Quality Assurance and Quality Control Samples

The laboratory supplied trip blanks to monitor possible contamination from sample handling, transport, and storage. The trip blanks accompanied the samples and were analyzed for the VOCs listed in Table 3-1 of Revised Exhibit A. Appendix C contains the analytical results for the quality assurance and quality control samples collected during the background sampling.

To evaluate the reproducibility of results, ENVIRON collected at least one duplicate water sample for every 10 samples collected during each surface water sampling event. The duplicate surface water samples were collected by pouring the surface water from the sampling device into two alternating sets of sample containers. The analytical results for the duplicate surface water samples are included with the sampling results summarized in Tables 3.

4. Applicable Surface Water Background Concentrations

The Applicable Surface Water Background Concentrations were calculated according to Note 4 of Table 3-1. The Applicable Surface Water Background Concentrations are defined as two standard deviations above the calculated mean of the background surface water samples. The Applicable Surface Water Background Concentrations are presented in Table 5.

Organic results flagged with a B qualifier, indicating that the compound was detected within the laboratories method blank, were disregarded and half of the EPA-approved quantification limit was used in its place. In addition, the results from the duplicate surface water samples were included with the background surface water samples.

C. Revised Site-Specific Acceptable Concentrations

The Applicable Subsurface Water Background Concentrations for five VOCs (methylene chloride, tetrachloroethene, 1,1,2-trichloroethane, trichloroethene and vinyl chloride), one semi-volatile organic compounds (SVOC) (bis (2-ethylhexyl) phthalate), one inorganic (antimony) and the PCBs were higher than their respective Acceptable Subsurface Water Concentrations as

originally listed in Table 3-1 of Revised Exhibit A. The background concentrations for these parameters now constitute the revised Acceptable Subsurface Water Concentrations as stated in Revised Exhibit A.

The Applicable Surface Water Background Concentrations for one VOC (1,2-dichloroethene (total)), five inorganics (arsenic, chromium VI, lead, zinc, and total cyanide) and the PCBs were higher than their respective Acceptable Stream Concentrations as originally listed in Table 3-1 of Revised Exhibit A. The background concentrations for these parameters now constitute the revised Acceptable Stream Concentrations as stated in Revised Exhibit A. Table 6 contains the revised Site-Specific Acceptable Concentrations².

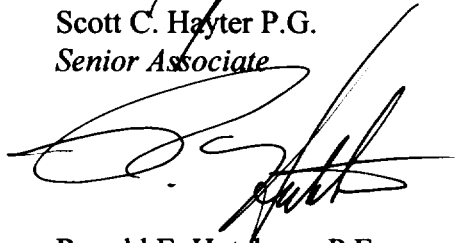
If you have any questions about this letter, please do not hesitate to contact us.

Sincerely,

ENVIRON International Corporation



Scott C. Hayter P.G.
Senior Associate



Ronald E. Hutchens, P.E.
Principal

SCH:als

P:\CP Files\Client Project Files\ECC\Word Files\Compliance Monitoring\Background\BG Report 2000rev1.doc

cc: Mr. Myron Waters - IDEM
Mr. Tim Harrison - CH2M Hill
Dr. Roy Ball - ENVIRON International Corp.
Mr. Norman Bernstein - N. W. Bernstein & Associates, L.L.C.
Mr. George Anastos - Versar, Inc.

² Table 6 was created from Table 3-1 of the Revised Exhibit A, entitled Site-Specific Acceptable Concentrations. Table 6 was created by revising Table 3-1 to include the Applicable Surface and Subsurface Water Background Concentrations.

TABLES

TABLE 1
Summary of Analytical Results for Background Well No. T-5 (Till Well)
ECC Superfund Site - Zionsville, Indiana
(Page 1 of 4)

SAMPLE LOCATION ENVIRON SAMPLE ID COLLECTION DATE COMMENTS	T-5 T5-980831 August-98	T-5 T5-980923 September-98	T-5 T5-981023 October-98	T-5 ECTGW5-01 November-98	T-5 T5-981207 December-98	T-5 T5-990112 January-99
Volatile Organic Compounds						
Acetone	10 U	10 U	10 U	3	2 B	2 U
1,1-Dichloroethene	1 U	1 U	5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloroethene (total)	1 U	1 U	5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	1 U	1 U	5 U	0.5 U	0.5 U	0.5 U
Methyl ethyl ketone	10 U	10 U	20 U	2 U	2 U	2 U
Methyl isobutyl ketone	10 U	10 U	20 U	2 U	2 U	2.5 U
Methylene chloride	5 U	190	5 U	2 B	0.6 B	0.7 B
Tetrachloroethene	1 U	1 U	5 U	0.5 U	0.5 U	0.5 U
Toluene	1 U	1 U	5 U	0.5 U	0.5 U	0.5 U
1,1,1-Trichloroethane	1 U	1 U	5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	1 U	1 U	5 U	0.5 U	0.5 U	0.5 U
Trichloroethene	1 U	1 U	5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	5 U	5 U	10 U	0.5 U	0.5 U	0.5 U
Xylenes (total)	1 B	1 U	10 U	0.5 U	0.5 U	0.5 U
Semi-Volatile Organic Compounds						
Bis (2-ethylhexyl) phthalate	2.8 U	3.55 U	2.5 U	4 J	10 U	2 J
1,2-Dichlorobenzene	11.1 U	14.2 U	10 U	10 U	10 U	10 U
Diethyl phthalate	11.1 U	14.2 U	10 U	10 U	10 U	10 U
Di-n-butyl phthalate	11.1 U	14.2 U	10 U	10 U	10 U	10 U
Isophorone	9.2 U	12 U	8.3 U	10 U	10 U	10 U
Naphthalene	11.1 U	14.2 U	10 U	10 U	10 U	10 U
Phenol	11.1 U	14.2 U	10 U	10 U	10 U	10 U

Notes: All concentrations are in ug/L.

U = Compound not detected above the adjacent method detection limit.

J = Estimated value.

B = Analyte was also detected in the associated blank.

TABLE 1
Summary of Analytical Results for Background Well No. T-5 (Till Well)
ECC Superfund Site - Zionsville, Indiana
(Page 2 of 4)

SAMPLE LOCATION ENVIRON SAMPLE ID COLLECTION DATE COMMENTS	T-5 T5-980831 August-98	T-5 T5-980923 September-98	T-5 T5-981023 October-98	T-5 ECTGW5-01 November-98	T-5 T5-981207 December-98	T-5 T5-990112 January-99
Inorganics						
Antimony	0.1 U	10	5 U	1.7 U	19.4	1.7 U
Arsenic	20 U	20 U	20 U	2.3 B	1.7 U	1.7 U
Barium	60	520	80	89.3	518	463
Beryllium	5 U	5 U	5 U	0.2 U	0.2 U	0.2 U
Cadmium	5 U	5 U	5 U	1 U	1.2 B	1 U
Cyanide (total)	5 U	7	5 U	10 U	10 U	10 U
Chromium VI	10 U	10 U	10 U	10 U	10 U	10 U
Lead	50 U	50 U	50 U	0.7 U	0.7 U	0.83 B
Manganese	83	420	480	321	208	304
Nickel	10 U	10 U	10	1.4 B	2.4 B	1.3 B
Silver	10 U	10 U	10 U	0.4 U	0.48 B	0.4 U
Tin	50 U	50 U	50 U	4.7 U	4.7 U	4.7 U
Vanadium	50 U	50 U	50 U	0.4 U	1 B	0.4 U
Zinc	10 U	130 U	10 U	1.5 U	89.4	78.4
Polychlorinated biphenyls						
Aroclor 1016	1 U	0.8 U	1 U	1 U	1 U	1 U
Aroclor 1221	1 U	0.8 U	1 U	2 U	2 U	2 U
Aroclor 1232	1 U	0.8 U	1 U	1 U	1 U	1 U
Aroclor 1242	1 U	0.8 U	1 U	1 U	1 U	1 U
Aroclor 1248	1 U	0.8 U	1 U	1 U	1 U	1 U
Aroclor 1254	1 U	0.8 U	1 U	1 U	1 U	1 U
Aroclor 1260	1 U	0.8 U	1 U	1 U	1 U	1 U

Notes: All concentrations are in ug/L.

B = Analyte value is < contract required detection limit but > = instrument detection limit.

U = Compound not detected above the adjacent method detection limit.

TABLE 1
Summary of Analytical Results for Background Well No. T-5 (Till Well)
ECC Superfund Site - Zionsville, Indiana
(Page 3 of 4)

ENVIRON SAMPLE ID MATRIX COLLECTION DATE COMMENTS	T-5 ECTGW5-02 February-99	T-5 T5-990315 March-99	T-5 T5-990415 April-99	T-5 ECTGW5-03 May-99	T-5 T5-990614 June-99	T-5 T5-990714 July-99
Volatile Organic Compounds						
Acetone	2 U	2.5 U	2 U	2 U	2 U	1.4 JB
1,1-Dichloroethene	0.5 U	0.5 U	1	0.5 U	0.5 U	0.5 U
1,2-Dichloroethene (total)	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methyl ethyl ketone	2 U	2.5 U	2 U	2 U	2 U	2.5 U
Methyl isobutyl ketone	2 U	0.79 J	2 U	2 U	2 U	2.5 U
Methylene chloride	0.7 B	0.4 JB	0.5 U	0.4 J	1	0.3 JB
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Xylenes (total)	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Semi-Volatile Organic Compounds						
Bis (2-ethylhexyl) phthalate	12 U	1 J	10 U	12 U	10 U	1 J
1,2-Dichlorobenzene	12 U	10 U	10 U	12 U	10 U	10 U
Diethyl phthalate	12 U	10 U	10 U	12 U	10 U	10 U
Di-n-butyl phthalate	12 U	10 U	10 U	12 U	10 U	10 U
Isophorone	12 U	10 U	10 U	12 U	10 U	10 U
Naphthalene	12 U	10 U	10 U	12 U	10 U	10 U
Phenol	12 U	10 U	10 U	2 J	10 U	10 U

Notes: All concentrations are in ug/L.

U = Compound not detected above the adjacent method detection limit.

J = Estimated value.

B = Analyte was also detected in the associated blank.

TABLE 1
Summary of Analytical Results for Background Well No. T-5 (Till Well)
ECC Superfund Site - Zionsville, Indiana
(Page 4 of 4)

ENVIRON SAMPLE ID MATRIX COLLECTION DATE COMMENTS	T-5 ECTGW5-02 February-99	T-5 T5-990315 March-99	T-5 T5-990415 April-99	T-5 ECTGW5-03 May-99	T-5 T5-990614 June-99	T-5 T5-990714 July-99
Inorganics						
Antimony	3 B	1.5 B	2 B	1 U	3.4 B	1.8 U
Arsenic	1.4 U	1.4 U	1.4 U	3 B	3.7 B	2 U
Barium	126	181	423	149	106	187
Beryllium	0.5 U	0.5 U	0.1 U	0.1 U	0.1 U	0.2 U
Cadmium	1.3 B	1.1 B	1.3 B	1.8 B	1.2 B	1.4 B
Cyanide (total)	10 U	7.7 U	4.7 U	4.7 U	7 B	2.8 U
Chromium VI	10 U	10 U	10 U	10 U	10 U	10 U
Lead	1.3 B	0.7 U	1.7 B	1 U	1 U	1 U
Manganese	149	171	181	265	245	373
Nickel	0.8 U	1.7 B	1.9 B	3.3 B	2.7 B	2 U
Silver	0.4 U	0.4 U	0.4 U	0.4 U	0.65 B	0.9 U
Tin	2.7 U	2.7 U	2 U	2 U	2 U	3.6 U
Vanadium	0.5 U	0.5 U	0.92 B	0.4 U	1 B	0.8 U
Zinc	24.1	15.6 B	94.7	13.5 B	3.4 B	18.5 B
Polychlorinated biphenyls						
Aroclor 1016	0.5 U	0.53 U	0.47 U	0.53 U	0.54 U	0.59 U
Aroclor 1221	1 U	1 U	0.94 U	1 U	1.1 U	1.2 U
Aroclor 1232	0.5 U	0.53 U	0.47 U	0.53 U	0.54 U	0.59 U
Aroclor 1242	0.5 U	0.53 U	0.47 U	0.53 U	0.54 U	0.59 U
Aroclor 1248	0.5 U	0.53 U	0.47 U	0.53 U	0.54 U	0.59 U
Aroclor 1254	0.5 U	0.53 U	0.47 U	0.53 U	0.54 U	0.59 U
Aroclor 1260	0.5 U	0.53 U	0.47 U	0.53 U	0.54 U	0.59 U

Notes: All concentrations are in ug/L.

B = Analyte value is < contract required detection limit but > = instrument detection limit.

U = Compound not detected above the adjacent method detection limit.

TABLE 2
Summary of Analytical Results for Background Well No. S-1 (Sand/Gravel Well)
ECC Superfund Site - Zionsville, Indiana
(Page 1 of 6)

SAMPLE LOCATION ENVIRON SAMPLE ID COLLECTION DATE COMMENTS	S-1 S1-980901 August-98	S-1 S1-980901DUP August-98 DUPLICATE	S-1 S1-980925 September-98	S-1 S1-980925DUP September-98 DUPLICATE	S-1 S1-981026 October-98	S-1 S1-981026DUP October-98 DUPLICATE
Volatile Organic Compounds						
Acetone	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	1 U	1 U	1 U	1 U	5 U	5 U
1,2-Dichloroethene (total)	1 U	1 U	1 U	1 U	5 U	5 U
Ethylbenzene	1 U	1 U	1 U	1 U	5 U	5 U
Methyl ethyl ketone	10 U	10 U	10 U	10 U	20 U	20 U
Methyl isobutyl ketone	10 U	10 U	10 U	10 U	20 U	20 U
Methylene chloride	5 U	5 U	130	310	5 U	5 U
Tetrachloroethene	1 U	1 U	1 U	1 U	5 U	5 U
Toluene	1 U	3	1 U	1 U	5 U	5 U
1,1,1-Trichloroethane	1 U	1 U	1 U	1 U	5 U	5 U
1,1,2-Trichloroethane	1 U	1 U	1 U	1 U	5 U	5 U
Trichloroethene	1 U	1 U	1 U	1 U	5 U	5 U
Vinyl chloride	5 U	5 U	5 U	5 U	10 U	10 U
Xylenes (total)	1 U	3	1 U	1 U	10 U	10 U
Semi-Volatile Organic Compounds						
Bis (2-ethylhexyl) phthalate	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U
Diethyl phthalate	10 U	10 U	10 U	10 U	10 U	10 U
Di-n-butyl phthalate	10 U	10 U	10 U	10 U	10 U	10 U
Isophorone	8.3 U	8.3 U	8.2 U	8.2 U	8.3 U	8.3 U
Naphthalene	10 U	10 U	10 U	10 U	10 U	10 U
Phenol	10 U	10 U	10 U	10 U	10 U	10 U

Notes: All concentrations are in ug/L.

U = Compound not detected above adjacent method detection limit.

TABLE 2
Summary of Analytical Results for Background Well No. S-1 (Sand/Gravel Well)
ECC Superfund Site - Zionsville, Indiana
(Page 2 of 6)

SAMPLE LOCATION ENVIRON SAMPLE ID COLLECTION DATE COMMENTS	S-1 S1-980901 August-98	S-1 S1-980901DUP August-98 DUPLICATE	S-1 S1-980925 September-98	S-1 S1-980925DUP September-98 DUPLICATE	S-1 S1-981026 October-98	S-1 S1-981026DUP October-98 DUPLICATE
Inorganics						
Antimony	100 U	100 U	5 U	5 U	5 U	5 U
Arsenic	20 U	20 U	20 U	20 U	20 U	20 U
Barium	330	320	31	350	350	340
Beryllium	5 U	5 U	5 U	5 U	5 U	5 U
Cadmium	5 U	5 U	5 U	5 U	5 U	5 U
Cyanide (total)	5 U	5 U	5 U	5 U	5 U	5 U
Chromium VI	10 U	10 U	10 U	10 U	10 U	10 U
Lead	50 U	50 U	50 U	50 U	50 U	50 U
Manganese	30	20	20	20	30	20
Nickel	10 U	10 U	10 U	10 U	10 U	10 U
Silver	10 U	10 U	10	20	10 U	10 U
Tin	50 U	50 U	50 U	50 U	50 U	50 U
Vanadium	50 U	50 U	50 U	50 U	50 U	50 U
Zinc	10 U	10 U	10 U	10 U	10 U	10 U
Polychlorinated biphenyls						
Aroclor 1016	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Aroclor 1221	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Aroclor 1232	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Aroclor 1242	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Aroclor 1248	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Aroclor 1254	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Aroclor 1260	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Notes: All concentrations are in ug/L.

U = Compound not detected above adjacent method detection limit.

TABLE 2
Summary of Analytical Results for Background Well No. S-1 (Sand/Gravel Well)
ECC Superfund Site - Zionsville, Indiana
(Page 3 of 6)

SAMPLE LOCATION ENVIRON SAMPLE ID COLLECTION DATE COMMENTS	S-1 ECSGW1-01 November-98	S-1 ECSGW1-01M November-98 DUPLICATE	S-1 S1-981207 December-98	S-1 S1-981207DUP December-98 DUPLICATE	S-1 S1-990112 January-99	S-1 S1-990112DUP January-99 DUPLICATE
Volatile Organic Compounds						
Acetone	3 B	NA	2 U	2 U	2 U	2 U
1,1-Dichloroethene	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloroethene (total)	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U
Methyl ethyl ketone	2 U	NA	2 U	2 U	2 U	2 U
Methyl isobutyl ketone	2 U	NA	2 U	2 U	2.5 U	2.5 U
Methylene chloride	2 B	NA	0.8 B	0.7 B	1 B	1 B
Tetrachloroethene	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U
1,1,1-Trichloroethane	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U
Xylenes (total)	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U
Semi-Volatile Organic Compounds						
Bis (2-ethylhexyl) phthalate	10 U	10 U	10 U	9 U	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	10 U	9 U	10 U	10 U
Diethyl phthalate	10 U	10 U	10 U	9 U	10 U	10 U
Di-n-butyl phthalate	10 U	10 U	10 U	9 U	10 U	10 U
Isophorone	10 U	10 U	10 U	9 U	10 U	10 U
Naphthalene	10 U	10 U	10 U	9 U	10 U	10 U
Phenol	10 U	10 U	10 U	9 U	10 U	10 U

Notes: All concentrations are in ug/L.

U = Compound not detected above adjacent method detection limit.

NA = Not Analyzed.

B = Analyte was also detected in the associated blank.

TABLE 2
Summary of Analytical Results for Background Well No. S-1 (Sand/Gravel Well)
ECC Superfund Site - Zionsville, Indiana
(Page 4 of 6)

SAMPLE LOCATION ENVIRON SAMPLE ID COLLECTION DATE COMMENTS	S-1 ECSGW1-01 November-98	S-1 ECSGW1-01M November-98 DUPLICATE	S-1 S1-981207 December-98	S-1 S1-981207DUP December-98 DUPLICATE	S-1 S1-990112 January-99	S-1 S1-990112DUP January-99 DUPLICATE
Inorganics						
Antimony	1.7 U	1.7 U	5.1 B	1.7 U	2.6 B	1.7 U
Arsenic	1.7 U	1.7 U	2 B	1.9 B	1.7 U	1.7 U
Barium	329	335	356	353	379	373
Beryllium	0.3 B	0.35 B	0.48 B	0.5 B	0.2 U	0.2 U
Cadmium	1 U	1 U	1 B	1 U	1 U	1 U
Cyanide (total)	10 U	10 U	10 U	10 U	10 U	10 U
Chromium VI	10 U	10 U	10 U	10 U	10 U	10 U
Lead	0.81 B	0.7 U	0.7 U	0.7 U	1.1 B	2.7 B
Manganese	18.4 E	18.6 E	19.3	19.1	20.8	29.2
Nickel	0.7 U	0.7 U	0.74 B	1.2 B	0.7 U	0.7 U
Silver	0.4 U	0.4 U	0.4 U	0.4 U	0.6 B	0.4 U
Tin	4.7 U	4.7 U	4.7 U	4.7 U	4.7 U	4.7 U
Vanadium	0.4 U	0.4 U	0.65 B	0.4 U	0.52 B	0.4 U
Zinc	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	4.6 B
Polychlorinated biphenyls						
Aroclor 1016	1 U	1 U	1 U	0.96 U	1 U	1 U
Aroclor 1221	2 U	2 U	2 U	1.9 U	2 U	2 U
Aroclor 1232	1 U	1 U	1 U	0.96 U	1 U	1 U
Aroclor 1242	1 U	1 U	1 U	0.96 U	1 U	1 U
Aroclor 1248	1 U	1 U	1 U	0.96 U	1 U	1 U
Aroclor 1254	1 U	1 U	1 U	0.96 U	1 U	1 U
Aroclor 1260	1 U	1 U	1 U	0.96 U	1 U	1 U

Notes: All concentrations are in ug/L.

B = Analyte value is < contract required detection limit but > = instrument detection limit.

U = Compound not detected above adjacent method detection limit.

E = Estimated value.

TABLE 2
Summary of Analytical Results for Background Well No. S-1 (Sand/Gravel Well)
ECC Superfund Site - Zionsville, Indiana
(Page 5 of 6)

SAMPLE LOCATION ENVIRON SAMPLE ID COLLECTION DATE COMMENTS	S-1 ECSGW1-02 February-99	S-1 S1-990318 March-99	S-1 S1-990318DUP March-99 DUPLICATE	S-1 S1-990420 April-99	S-1 ECSGW1-03 May-99	S-1 S1-990614 June-99	S-1 S1-990714 July-99
Volatile Organic Compounds							
Acetone	2 U	2.5 U	2.5 U	2 U	2 U	2 U	1.3 JB
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloroethene (total)	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methyl ethyl ketone	2 U	2.5 U	2.5 U	2 U	2 U	2 U	2.5 U
Methyl isobutyl ketone	2 U	2.5 U	2.5 U	2 U	2 U	2 U	2.5 U
Methylene chloride	0.7 B	0.4 J	0.5	0.5 B	0.7	1	0.4 JB
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.8	0.5 U	0.5 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Xylenes (total)	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Semi-Volatile Organic Compounds							
Bis (2-ethylhexyl) phthalate	10 U	10 U	9 U	1 J	10 U	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	9 U	10 U	10 U	10 U	10 U
Diethyl phthalate	10 U	10 U	9 U	10 U	10 U	10 U	10 U
Di-n-butyl phthalate	10 U	10 U	9 U	10 U	10 U	10 U	10 U
Isophorone	10 U	10 U	9 U	10 U	10 U	10 U	10 U
Naphthalene	10 U	10 U	9 U	10 U	10 U	10 U	10 U
Phenol	10 U	10 U	9 U	10 U	10 U	10 U	10 U

Notes: All concentrations are in ug/L.

U = Compound not detected above adjacent method detection limit.

J = Estimated value.

B = Analyte was also detected in the associated blank.

TABLE 2
Summary of Analytical Results for Background Well No. S-1 (Sand/Gravel Well)
ECC Superfund Site - Zionsville, Indiana
(Page 6 of 6)

SAMPLE LOCATION ENVIRON SAMPLE ID COLLECTION DATE COMMENTS	S-1 ECSGW1-02 February-99	S-1 S1-990318 March-99	S-1 S1-990318DUP March-99 DUPLICATE	S-1 S1-990420 April-99	S-1 ECSGW1-03 May-99	S-1 S1-990614 June-99	S-1 S1-990714 July-99
Inorganics							
Antimony	1.4 B	1 U	1 U	1.5 B	1 U	1 U	1.8 U
Arsenic	1 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	2.6 B
Barium	355	387	392	756	386	374	380
Beryllium	0.5 U	0.5 U	0.5 U	0.1 U	0.63 B	0.1 U	0.2 U
Cadmium	1.1 B	0.75 B	0.75 B	0.57 B	0.97 B	0.95 B	0.88 B
Cyanide (total)	10 U	7.7 U	7.7 U	4.7 U	4.7 U	4.7 U	2.8 U
Chromium VI	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Lead	0.7 U	0.7 U	0.7 U	1.4 B	1 U	1 U	1 U
Manganese	26.9	29.4	17.9	17.1	17.8	25.2 E	18.9
Nickel	1.3 B	1.3	0.8 U	0.5 U	1.3 B	0.96 B	1 U
Silver	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.9 U
Tin	2.7 U	2.7 U	2.7 U	2 U	2 U	2 U	3.6 U
Vanadium	0.5 U	0.5 U	0.5 U	0.4 U	0.4 U	0.4 U	0.8 U
Zinc	0.8 U	0.8 U	0.8 U	109	4.8 B	0.4 U	1.1 U
Polychlorinated biphenyls							
Aroclor 1016	0.48 U	0.49 U	0.5 U	0.48 U	0.54 U	0.49 U	0.5 U
Aroclor 1221	0.95 U	0.98 U	1 U	0.97 U	1.1 U	0.98 U	1 U
Aroclor 1232	0.48 U	0.49 U	0.5 U	0.48 U	0.54 U	0.49 U	0.5 U
Aroclor 1242	0.48 U	0.49 U	0.5 U	0.48 U	0.54 U	0.49 U	0.5 U
Aroclor 1248	0.48 U	0.49 U	0.5 U	0.48 U	0.54 U	0.49 U	0.5 U
Aroclor 1254	0.48 U	0.49 U	0.5 U	0.48 U	0.54 U	0.49 U	0.5 U
Aroclor 1260	0.48 U	0.49 U	0.5 U	0.48 U	0.54 U	0.49 U	0.5 U

Notes: All concentrations are in ug/L.

B = Analyte value is < contract required detection limit but > = instrument detection limit.

U = Compound not detected above adjacent method detection limit.

E = Exceeds the upper limit of the calibration range of the instrument for that specific analysis.

TABLE 3
Applicable Subsurface Water Background Concentrations
ECC Superfund Site - Zionsville, Indiana

Parameter	Acceptable Subsurface Water Concentration ¹ (ug/L)	Applicable Subsurface Water Background Concentrations ² (ug/L)	Applicable Subsurface Water Background Concentrations Exceeding The Acceptable Subsurface Water Concentrations (ug/L)
Volatile Organic Compounds			
Acetone	3,500	5.7	
1,1-Dichloroethene	7	6.3	
1,2-Dichloroethene (total)	70	5.0	
Ethylbenzene	680	5.0	
Methylene chloride	4.7	156.6	156.6
Methyl ethyl ketone	170	5.0	
Methyl isobutyl ketone	1,750	6.4	
Tetrachloroethene	0.69	5.0	5.0
Toluene	2,000	5.7	
1,1,1-Trichloroethane	200	5.0	
1,1,2-Trichloroethane	0.61	5.0	5.0
Trichloroethene	5	6.4	6.4
Vinyl chloride	2	5.0	5.0
Xylenes (total)	10,000	5.7	
Semi-Volatile Organic Compounds			
Bis (2-ethylhexyl) phthalate	2.5	7.1	7.1
Di-n-butyl phthalate	3500	5.0	
1,2-Dichlorobenzene	600	5.0	
Diethyl phthalate	28,000	5.0	
Isophorone	8.5	5.0	
Naphthalene	14,000	5.0	
Phenol	1,400	6.0	
Inorganics			
Antimony	14	46.5	46.5
Arsenic	50	6.6	
Barium	1,000	630.5	
Beryllium	4	3.7	
Cadmium	10	3.3	
Chromium VI	50	5.0	
Lead	50	2.1	
Manganese	7,000	518.2	
Nickel	150	30.2	
Silver	50	11.6	
Tin	21,000	25.0	
Vanadium	245	39.2	
Zinc	7,000	78.3	
Cyanide (total)	154	6.1	
Polychlorinated biphenyls			
Aroclor 1016	0.0045	0.5	0.5
Aroclor 1221	0.0045	1.0	1.0
Aroclor 1232	0.0045	0.5	0.5
Aroclor 1242	0.0045	0.5	0.5
Aroclor 1248	0.0045	0.5	0.5
Aroclor 1254	0.0045	0.5	0.5
Aroclor 1260	0.0045	0.5	0.5

Notes:

¹ Acceptable Subsurface Water Concentrations as presented in Revised Exhibit A, Table 3-1.

² Applicable Subsurface Water Background Concentrations as defined as two standard deviations above the calculated mean of the 12 background sample sets.

(i.e. Applicable Background Concentrations = Mean + (Standard Deviation * 2))

TABLE 4
Summary of Analytical Results for Background Surface Water Samples
ECC Superfund Site - Zionsville, Indiana
(Page 1 of 6)

SAMPLE LOCATION ENVIRON SAMPLE ID COLLECTION DATE COMMENTS	SW-1 ECSW1-01 November-98	SW-1 SW1-981207 December-98	SW-1 ECSW1-02 February-99	SW-1 SW1-990315 March-99	SW-1 SW1-990415 April-99	SW-1 SW1-990415DUP April-99 DUPLICATE	SW-1 ECSW1-03 May-99
Volatile Organic Compounds							
1,2-Dichloroethene (total)	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylene chloride	1 B	0.6 B	0.8 B	0.6 B	0.5 J	1	1
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Semi-Volatile Organic Compounds							
Bis (2-ethylhexyl) phthalate	10 U	10 U	1 J	9 U	10 U	10 U	5 J
1,2-Dichlorobenzene	10 U	10 U	10 U	9 U	10 U	10 U	10 U
Diethyl phthalate	10 U	10 U	10 U	9 U	10 U	10 U	10 U
Di-n-butyl phthalate	10 U	10 U	10 U	9 U	10 U	10 U	10 U
Naphthalene	10 U	10 U	10 U	9 U	10 U	10 U	10 U
Phenol	10 U	10 U	10 U	9 U	10 U	10 U	10 U

Notes: All concentrations are in ug/L.

U = Compound not detected above adjacent method detection limit.

J = Estimated value.

B = Analyte was also detected in the associated blank.

TABLE 4
Summary of Analytical Results for Background Surface Water Samples
ECC Superfund Site - Zionsville, Indiana
(Page 2 of 6)

SAMPLE LOCATION ENVIRON SAMPLE ID COLLECTION DATE COMMENTS	SW-1 ECSW101 November-98	SW-1 SW1-981207 December-98	SW-1 ECSW1-02 February-99	SW-1 SW1-990315 March-99	SW-1 SW1-990415 April-99	SW-1 SW1-990415DUP April-99 DUPLICATE	SW-1 ECSW1-03 May-99
Inorganics							
Arsenic	1.7 U	1.9 B	1.4 U	1.4 U	22.9	1.4 U	2.9 B
Cyanide (total)	10 U	10 U	10 U	7.7 U	4.7 U	4.7 U	10.3
Chromium VI	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Lead	0.7 U	0.7 U	1.6 B	2.4 B	49.7	8.6	1 U
Nickel	15.9 U	27.9	8.2	18	97.7	15.8	20.5
Zinc	1.5 U	11.2 B	3.8 B	27.8	267	84.8 E	14.2 B
Polychlorinated biphenyls							
Aroclor 1016	1 U	0.96 U	0.48 U	0.47 U	0.5 U	0.5 U	0.5 U
Aroclor 1221	2 U	1.9 U	0.97 U	0.94 U	1 U	1 U	1 U
Aroclor 1232	1 U	0.96 U	0.48 U	0.47 U	0.5 U	0.5 U	0.5 U
Aroclor 1242	1 U	0.96 U	0.48 U	0.47 U	0.5 U	0.5 U	0.5 U
Aroclor 1248	1 U	0.96 U	0.48 U	0.47 U	0.5 U	0.5 U	0.5 U
Aroclor 1254	1 U	0.96 U	0.48 U	0.47 U	0.5 U	0.5 U	0.5 U
Aroclor 1260	1 U	0.96 U	0.48 U	0.47 U	0.5 U	0.5 U	0.5 U

Notes: All concentrations are in ug/L.

B = Analyte value is < contract required detection limit but > = instrument detection limit.

U = Compound not detected above adjacent method detection limit.

E = Exceeds the upper limit of the calibration range of the instrument for that specific analysis.

TABLE 4
Summary of Analytical Results for Background Surface Water Samples
ECC Superfund Site - Zionsville, Indiana
(Page 3 of 6)

SAMPLE LOCATION ENVIRON SAMPLE ID COLLECTION DATE COMMENTS	SW-1 SW1-990603 June-99	SW-1 SW1-990603DUP June-99 DUPLICATE	SW-1 SW1-990614 June-99	SW-1 SW1-990614DUP June-99 DUPLICATE	SW-1 SW1-990630 June-99	SW-1 SW1-990630DUP June-99 DUPLICATE
Volatile Organic Compounds						
1,2-Dichloroethene (total)	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylene chloride	1 B	1 B	1	0.9	0.5 U	0.5 U
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Semi-Volatile Organic Compounds						
Bis (2-ethylhexyl) phthalate	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U
Diethyl phthalate	10 U	10 U	10 U	10 U	10 U	10 U
Di-n-butyl phthalate	10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene	10 U	10 U	10 U	10 U	10 U	10 U
Phenol	10 U	10 U	10 U	10 U	10 U	10 U

Notes: All concentrations are in ug/L.

U = Compound not detected above adjacent method detection limit.

B = Analyte was also detected in the associated blank.

TABLE 4
Summary of Analytical Results for Background Surface Water Samples
ECC Superfund Site - Zionsville, Indiana
(Page 4 of 6)

SAMPLE LOCATION ENVIRON SAMPLE ID COLLECTION DATE COMMENTS	SW-1 SW1-990603 June-99	SW-1 SW1-990603DUP June-99 DUPLICATE	SW-1 SW1-990614 June-99	SW-1 SW1-990614DUP June-99 DUPLICATE	SW-1 SW1-990630 June-99	SW-1 SW1-990630DUP June-99 DUPLICATE
Inorganics						
Arsenic	3 B	3 B	3.4 B	3.3 B	1.6 U	1.6 U
Cyanide (total)	4.7 U	40.5	7.7 B	10	4.7 U	4.7 U
Chromium VI	10 U	10 U	10 U	10 U	10 U	10 U
Lead	1 U	1 U	1.7 B	1.5 B	1 U	1 U
Nickel	3.3 B	4.2 B	20	20.8	15.4	13.1
Zinc	5.5 B	2.7 B	0.4 U	37.1	7.3 B	5 B
Polychlorinated biphenyls						
Aroclor 1016	0.5 U	0.5 U	0.48 U	0.5 U	0.48 U	0.5 U
Aroclor 1221	1 U	1 U	0.95 U	1 U	0.96 U	0.99 U
Aroclor 1232	0.5 U	0.5 U	0.48 U	0.5 U	0.48 U	0.5 U
Aroclor 1242	0.5 U	0.5 U	0.48 U	0.5 U	0.48 U	0.5 U
Aroclor 1248	0.5 U	0.5 U	0.48 U	0.5 U	0.48 U	0.5 U
Aroclor 1254	0.5 U	0.5 U	0.48 U	0.5 U	0.48 U	0.5 U
Aroclor 1260	0.5 U	0.5 U	0.48 U	0.5 U	0.48 U	0.5 U

Notes: All concentrations are in ug/L.

B = Analyte value is < contract required detection limit but > = instrument detection limit.

U = Compound not detected above adjacent method detection limit.

TABLE 4
Summary of Analytical Results for Background Surface Water Samples
ECC Superfund Site - Zionsville, Indiana
(Page 5 of 6)

SAMPLE LOCATION ENVIRON SAMPLE ID COLLECTION DATE COMMENTS	SW-1 SW1-990714 July-99	SW-1 SW1-990714DUP July-99 DUPLICATE	SW-1 SW1-000210 February-00	SW-1 SW1-000210DUP February-00 DUPLICATE	SW-1 SW1-000309 March-00	SW-1 SW1-000309DUP March-00 DUPLICATE
Volatile Organic Compounds						
1,2-Dichloroethene (total)	11	11	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylene chloride	1 B	1 B	3	3	1 B	0.9 B
Tetrachloroethene	4	4	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	0.6	0.6	0.3 J	0.2 J	0.2 J	0.2 JB
1,1,1-Trichloroethane	6	7	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene	14	14	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Semi-Volatile Organic Compounds						
Bis (2-ethylhexyl) phthalate	10 U	10 U	9 U	10 U	10 U	9 U
1,2-Dichlorobenzene	10 U	10 U	9 U	10 U	10 U	9 U
Diethyl phthalate	10 U	10 U	9 U	10 U	10 U	9 U
Di-n-butyl phthalate	10 U	10 U	9 U	10 U	10 U	9 U
Naphthalene	10 U	10 U	9 U	10 U	10 U	9 U
Phenol	10 U	10 U	9 U	10 U	10 U	9 U

Notes: All concentrations are in ug/L.

U = Compound not detected above adjacent method detection limit.

J = Estimated value.

B = Analyte was also detected in the associated blank.

TABLE 4
Summary of Analytical Results for Background Surface Water Samples
ECC Superfund Site - Zionsville, Indiana
(Page 6 of 6)

SAMPLE LOCATION ENVIRON SAMPLE ID COLLECTION DATE COMMENTS	SW-1 SW1-990714 July-99	SW-1 SW1-990714DUP July-99 DUPLICATE	SW-1 SW1-000210 February-00	SW-1 SW1-000210DUP February-00 DUPLICATE	SW-1 SW1-000309 March-00	SW-1 SW1-000309DUP March-00 DUPLICATE
Inorganics						
Arsenic	5.2 B	5.4 B	3.8 B	2 B	1.6 U	1.6 U
Cyanide (total)	2.8 U	2.8 U	0.9 U	4.4 B	0.9 U	0.9 U
Chromium VI	10 U	10 U	119	109	15.8	15.6
Lead	1 U	1 U	3.9	4.4	1 U	1 U
Nickel	11.1	12	19.8	19.9	18.6	18.6
Zinc	28.8	30.5	22.7	23.9	0.5 U	0.5 U
Polychlorinated biphenyls						
Aroclor 1016	0.5 U	0.5 U	0.48 U	0.49 U	0.5 U	0.5 U
Aroclor 1221	1 U	1 U	0.95 U	0.98 U	1 U	1 U
Aroclor 1232	0.5 U	0.5 U	0.48 U	0.49 U	0.5 U	0.5 U
Aroclor 1242	0.5 U	0.5 U	0.48 U	0.49 U	0.5 U	0.5 U
Aroclor 1248	0.5 U	0.5 U	0.48 U	0.49 U	0.5 U	0.5 U
Aroclor 1254	0.5 U	0.5 U	0.48 U	0.49 U	0.5 U	0.5 U
Aroclor 1260	0.5 U	0.5 U	0.48 U	0.49 U	0.5 U	0.5 U

Notes: All concentrations are in ug/L.

B = Analyte value is < contract required detection limit but > = instrument detection limit.

U = Compound not detected above adjacent method detection limit.

TABLE 5
Applicable Surface Water Background Concentrations
ECC Superfund Site - Zionsville, Indiana

Parameter	Acceptable Stream Concentration ¹ (ug/L)	Applicable Surface Water Background Concentrations ² (ug/L)	Applicable Surface Water Background Concentrations Exceeding The Acceptable Stream Concentrations (ug/L)
Volatile Organic Compounds			
1,2-Dichloroethene (total)	1.85	9.4	9.4
Ethylbenzene	3,280	5.0	
Methylene chloride	15.7	7.4	
Tetrachloroethene	8.85	5.5	
Toluene	3,400	8.0	
1,1,1-Trichloroethane	5,280	6.2	
1,1,2-Trichloroethane	41.8	5.0	
Trichloroethene	80.7	11.6	
Vinyl chloride	525	5.0	
Semi-Volatile Organic Compounds			
Bis (2-ethylhexyl) phthalate	50,000	6.6	
Di-n-butyl phthalate	154,000	5.0	
1,2-Dichlorobenzene	763	5.0	
Diethyl phthalate	52,100	5.0	
Naphthalene	620	5.0	
Phenol	570	5.0	
Inorganics			
Arsenic	0.0175	14.0	14.0
Chromium VI	11	86.0	86.0
Lead	10	26.8	26.8
Nickel	100	59.7	
Zinc	47	152.0	152.0
Cyanide (total)	5.2	23.9	23.9
Polychlorinated biphenyls			
Aroclor 1016	0.000079	0.5	0.5
Aroclor 1221	0.000079	1.0	1.0
Aroclor 1232	0.000079	0.5	0.5
Aroclor 1242	0.000079	0.5	0.5
Aroclor 1248	0.000079	0.5	0.5
Aroclor 1254	0.000079	0.5	0.5
Aroclor 1260	0.000079	0.5	0.5

Notes:

¹ Acceptable Stream Concentrations as presented in Revised Exhibit A, Table 3-1.

² Applicable Surface Water Background Concentrations as defined as two standard deviations above the calculated mean of the 12 background sample sets.
(i.e. Applicable Background Concentrations = Mean + (Standard Deviation * 2))

TABLE 6
Revised Site-Specific Acceptable Concentrations
ECC Superfund Site - Zionsville, Indiana
(Page 1 of 2)

Parameter	Acceptable Subsurface Water Concentration ¹ (ug/L)	Acceptable Stream Concentration ^{2,3} (ug/L)	Acceptable Soil Concentration ^{4,5,6} (ug/Kg)
Volatile Organic Compounds			
Acetone	3,500 RB		2,196
1,1-Dichloroethene	7 MCL	1.85	762
1,2-Dichloroethene (total)	70 MCL	15.7 SB	5,782
Ethylbenzene	680 MCL	3,280	207,464
Methylene chloride	15.7 SS	15.7	126
Methyl ethyl ketone	170 LDWHA		352
Methyl isobutyl ketone	1,750 RB		18,200
Tetrachloroethene	5.0 SS	8.85	77
Toluene	2,000 MCL	3,400	546,134
1,1,1-Trichloroethane	200 MCL	5,280	47,871
1,1,2-Trichloroethane		41.8	71
Trichloroethene		80.7	812
Vinyl chloride	5.0 SS	525	8.3
Xylenes (total)	10,000 MCL		5,596,192
Semi-Volatile Organic Compounds			
Bis (2-ethylhexyl) phthalate		50,000	
Di-n-butyl phthalate	3,500 RB	154,000	
1,2-Dichlorobenzene	600 MCL	763	370,160
Diethyl phthalate	28,000 RB	52,100	
Isophorone	8.5 RB		
Naphthalene	14,000 RB	620	
Phenol	1,400 RB	570	51,680
Inorganics			
Antimony			
Arsenic	50 MCL	10.0 SB	
Barium	1,000 MCL		
Beryllium	4 MCL		
Cadmium	10 MCL		
Chromium VI	50 MCL	30.0 SB	
Lead	50 MCL	2.0 SB	
Manganese	7,000 RB		
Nickel	150 LDWHA	100	
Silver	50 MCL		
Tin	21,000 RB		
Vanadium	245 RB		
Zinc	7,000 RB	152.0 SB	
Cyanide (total)	154 LDWHA	23.9 SB	
Polychlorinated biphenyls			
Aroclor 1016	0.5 SS	0.5 SB	
Aroclor 1221	1.0 SS	1.0 SB	
Aroclor 1232	0.5 SS	0.5 SB	
Aroclor 1242	0.5 SS	0.5 SB	
Aroclor 1248	0.5 SS	0.5 SB	
Aroclor 1254	0.5 SS	0.5 SB	
Aroclor 1260	0.5 SS	0.5 SB	

TABLE 6
Revised Site-Specific Acceptable Concentrations
ECC Superfund Site - Zionsville, Indiana
(Page 2 of 2)

Notes:

¹ RB =

Risk Based standard. U.S. EPA, Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals), December 1991.

EPA = Letter from Michael McAteer of United States Environmental Protection Agency to the Enviro-Chem Trustees, October 12, 1995.

MCL = Drinking Water Maximum Contaminant Level. 40 CFR 141.

SSB = Applicable Subsurface Water Background Concentrations as defined as two standard deviations above the calculated mean of 12 sample sets of background subsurface water samples. Background subsurface water samples were collected from wells T-5 and S-1.

LDWHA = Lifetime Drinking Water Health Advisory. U.S. EPA, Superfund Public Health Evaluation Manual update of November 16, 1987.

Applicable Subsurface Water Background Concentrations have been shaded and are shown in bold.

² SB = Applicable Surface Water Background Concentrations as defined as two standard deviations above the calculated mean of 12 sample sets of background surface water samples. Background surface water samples were collected from the surface water sample location SW-1.

Applicable Surface Water Background Concentrations have been shaded and are shown in bold.

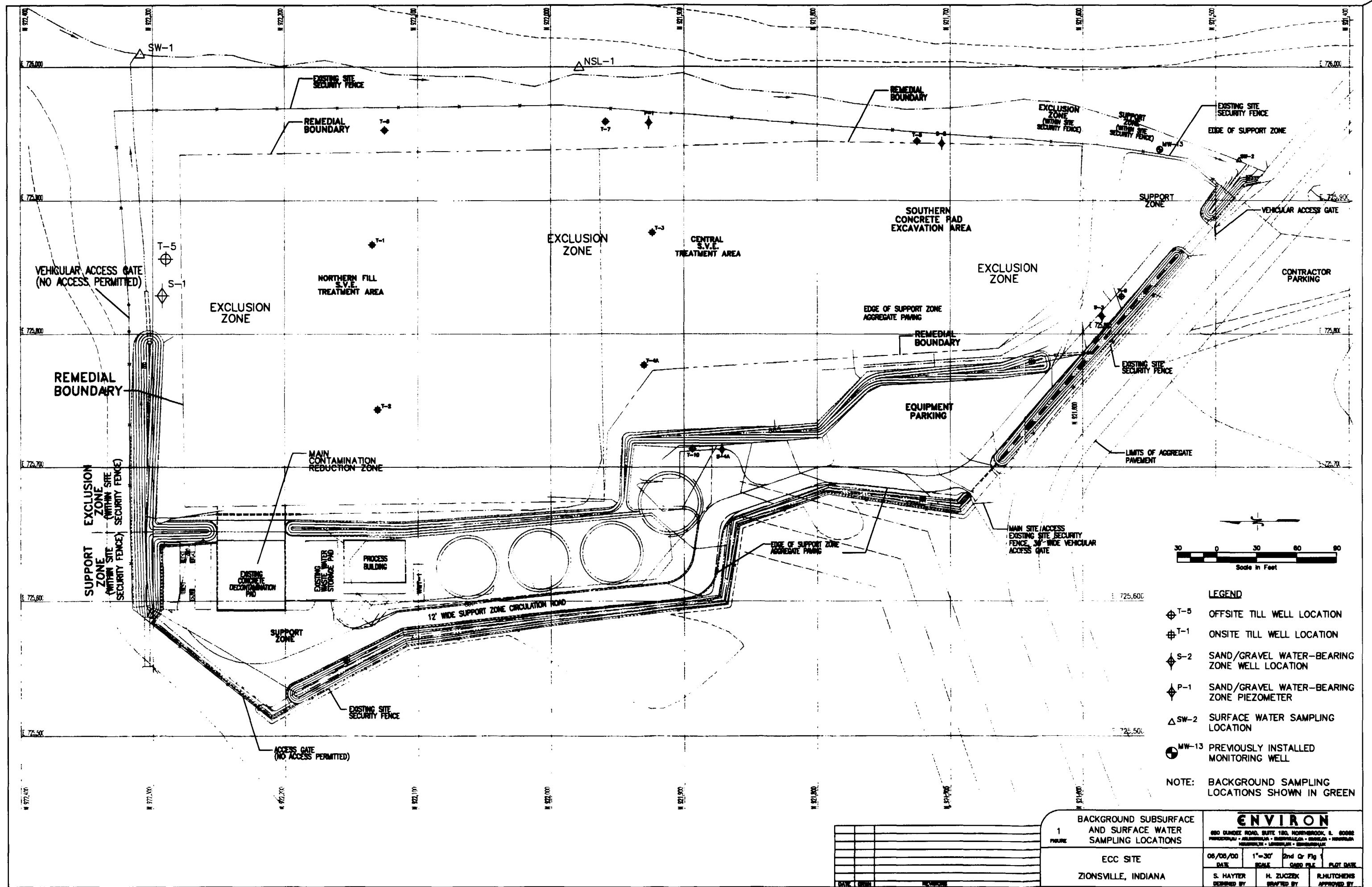
³ Stream Criteria, from Table 1 of the Record of Decision for the site, September 25, 1987 (or calculated on the same basis).

⁴ Acceptable Soil Concentration is based on ingestion of subsurface water at the site boundary, assuming a dilution of leachate to subsurface water of 1:196 (Appendix B).

⁵ The Acceptable Soil Concentrations, within the meaning of this Exhibit A and the Consent Decree, will be achieved when the arithmetic average of the soil sample results for each parameter, assigning all nondetect results a value of 1/2 the detection limit, do not exceed the values set forth in this table by more than 25%.

⁶ Revised Site-Specific Acceptable Soil Concentrations were calculated in accordance with the procedures in Appendix B of Exhibit A using updated Acceptable Subsurface Water Concentrations (shaded) and the f_{oc} value corresponding to the 90% lower confidence limit of the mean of the TOC values from the TOC investigation.

FIGURES



1 FIGURE		BACKGROUND SUBSURFACE AND SURFACE WATER SAMPLING LOCATIONS		ENVIRON 680 DUNDICE ROAD, SUITE 180, NORTHBROOK, IL 60062 PHOTOGRAPHY • AERIALS • REMEDIATION • DESIGN • CONSTRUCTION • MONITORING	
ECC SITE		ZIONSVILLE, INDIANA		DATE: 06/06/00	
S. HAYTER DESIGNED BY		H. ZUCZEK DRAFTED BY		R. HUTCHENS APPROVED BY	

APPENDIX A

Section 6, Table 7-1 and Addendum No.1 of the Field Sampling Plan

6.0 Sampling Procedures and Equipment

Detailed procedures for sample collection and a general description of the proposed sampling equipment are presented in this section. Detailed information pertaining to equipment maintenance and calibration is presented in Volume I of this QAPP. All sampling activities will be documented in the field logbook, as described in Volume I, Section 5.1.2.

6.1 Extracted Soil Vapor

Soil vapor samples will be collected from the combined vapor flow prior to entering the activated carbon system and from individual trenches or extraction well laterals for volatile organic compound (VOC) analysis as follows:

- ▶ A calibrated personal sampling pump (whose flow can be determined within ± 5 percent of the recommended flow rate) will be attached to the sampling tap installed on the SVE system. Appendix F of Volume III provides procedures for calibration of personal sampling pumps;
- ▶ A sampling train of two activated charcoal tubes (known as National Institute for Occupational Safety and Health (NIOSH) tubes - see Appendix C of Volume III) will be connected in series to the personal sampling pump such that the soil vapor is pulled through the tubes before going through the pump;
- ▶ The sample tap valve will be opened;
- ▶ The volume of vapor required to allow attainment of the required method detection limits (10 liters) will be pumped at a flow rate of 0.2 liters per minute for a total of 50 minutes;
- ▶ The sampling tap valve will be closed at the end of the sampling interval;
- ▶ The activated charcoal tubes will be removed, capped, placed in sealable plastic "whirl pak" bags (as supplied by the selected analytical laboratory), and labeled; and
- ▶ The tubes will be carefully packed into new, clean paint cans with loose charcoal in the bottom, which will then be stored in a cooled container, separated from other types of environmental samples.

The phenol vapor samples will be collected as follows:

- ▶ A calibrated personal sampling pump (whose flow rate can be determined within ± 5 percent of the recommended flow rate) will be attached to the sampling tap on the SVE system;
- ▶ An XAD-7 sorbent tube (see Appendix C of Volume III) will be connected to the personal sampling pump such that the soil vapor is pulled through the tube before going through the pump;
- ▶ The sample tap valve will be opened;
- ▶ The volume of vapor required to allow attainment of the required method detection limits (10 liters) will be pumped at a flow rate of 0.1 liters per minute for a total of 100 minutes;
- ▶ The sampling tap valve will be closed at the end of the sampling interval;
- ▶ The XAD-7 tubes will be removed, capped, placed in sealable plastic whirl pak bags, and labeled; and
- ▶ The tubes will be carefully packed into new, clean paint cans with loose charcoal in the bottom, which will then be stored in a cooled container, separated from other types of environmental samples.

The soil vapor sampling procedures for VOCs and phenol analyses will be modified during the restart spike events by using a flow rate of 0.04 liters per minute for a total of 5 hours, starting 30 minutes after restarting the SVE system, as specified in Section 4.2.1 of Exhibit A.

Decontamination of the vapor sampling equipment will be conducted prior to any sampling and between sampling events by purging the sampling train (except the tubes) with nitrogen to remove any residual extracted soil vapor.

Field blanks will be obtained by drawing ambient air through the decontaminated sampling train and collecting those samples in sample tubes. The number of field blanks to be collected is one field blank per group of 10 or fewer samples. No field blank will be collected for the combined vapor flow sampling (unless the combined vapor sampling coincides with the

individual extraction trenches vapor sampling) because only one sample will be collected approximately 26 times (depending on the duration of SVE operation).

Trip blanks will consist of unbroken activated charcoal tubes that are kept with the VOC samples from individual trenches throughout the sampling event. These unbroken tubes will then be broken at the beginning of the sampling event, capped, packaged for shipment with the other samples, and submitted to the laboratory for analysis. There will be one trip blank included in each sample shipping container. No trip blanks will be collected specifically for the combined vapor flow sampling.

The laboratory will analyze the vapor sample tube to determine if VOCs have been collected on the adsorbent media within the tube.

The selected analytical laboratory will report if any breakthrough is observed in any of the vapor samples. If breakthrough does occur, the sampling rate and/or time of collection will be modified to avoid breakthrough in subsequent samples. However, after the organic levels have decreased as a result of the operation of the SVE, the originally planned sample rates and times should be reinstated.

6.2 Soil

6.2.1 SVE Treatment Area Soil

Soil samples will be collected by using a 2-inch diameter split-spoon sampler at the locations and depths specified by the U.S. EPA and IDEM.

The procedure to obtain soil samples is as follows:

- ▶ A 2-foot by 2-foot hole will be dug by hand into the temporary cover (3 feet of clay and 12 inches of top soil), keeping each cover layer separate;
- ▶ Soil samples will be collected at the specified depths, taking into account the depth of the fill used to grade the site prior to installing the temporary cover; and
- ▶ The temporary cover layers will be replaced.

One duplicate sample will be collected per group of 10 or fewer soil samples. Drilling augers will be steam cleaned between each sampling location, and split-spoon samplers will be steam cleaned and rinsed with distilled water between the collection of each sample. Any other equipment that comes into contact with a sample will be decontaminated as described in Table 6-1.

6.2.2 Borrow Area Soils

The borrow area soils slated for use in the final cover and as backfill for the southern concrete pad excavation will be sampled using a test pit operation procedure where an excavator or backhoe will dig from surface to the intended vertical limit of useable soils. Sampling will include discrete sampling of the soils throughout the vertical profile of the borrow area.

The limits of the useable soils will be determined by the geotechnical soil analysis (e.g. gradation, Atterberg limits, etc.) as specified in the Technical Specifications and as directed by Appendix A of the Construction Quality Assurance Plan (CQAP). The contractor will be responsible for determining the required number of samples based on the number of borrow areas and useable soils configuration (horizontal/vertical) in each. The final number of samples and analyses of borrow soils will be approved by the Engineer prior to the Contractor performing the sampling.

6.3 Subsurface Water Sampling

Samples from the subsurface wells will be collected semiannually during the operation of the SVE system (Soils Cleanup Verification Phase) and analyzed as specified in Section 4.3. Compliance monitoring will be continued on a semiannual basis for 7 years after Soil Cleanup Verification is accomplished, as specified in Section 4.0 of Exhibit A to the Consent Decree.

Table 6-1. Decontamination Protocol for Sampling Equipment

Step Number	Description
1	Scrub equipment thoroughly with soft-bristled brush in a low-suds detergent solution.
2	Rinse equipment with tap water by submerging and/or spraying.
3	Rinse equipment with methanol by spraying until dripping; retain drippings.
4	Rinse equipment with distilled water by spraying until dripping; retain drippings.
5	Rinse equipment with distilled water a second time by spraying until dripping; retain drippings.
6	Place equipment on plastic or aluminum foil and allow to air dry for 5 to 10 minutes.
7	Wrap equipment in aluminum foil (shiny side out) for handling and/or storage until next use.

6.3.1 Water Level Measurement

Static water levels will be measured to the nearest 0.01 foot in each monitoring well and the piezometer at each sampling event and recorded in the field notebook. The water level surface will be measured prior to well purging and sampling by using an electric water level meter. Before lowering the probe in the well, the batteries will be checked by pressing the test button on the instrument. The probe will be slowly lowered into the well until contact with the water surface is indicated on the meter. The probe will be withdrawn just above the water surface, and a second reading will be taken prior to withdrawing the probe from the well. Both readings will be recorded in the field logbook. The probe will be decontaminated prior to inserting the instrument into a well by washing with a detergent such as Alconox, rinsing with methanol, and rinsing three times with distilled water.

Each well will have a reference point, indicated on the inner well casing, from which water level measurements will be taken. The reference point elevation on the well will be

established by a survey with respect to U.S. Datum mean sea level elevation to an accuracy of 0.01 feet for computation of the subsurface water elevation.

6.3.2 Well Depth Measurement

The total depth of the well will be measured and recorded prior to well purging and sampling. A weight tied to a length of cotton cord will be used to tag the bottom of the well, and the length of cord used will be measured to establish well depth. The weight will be rinsed with distilled water and the cotton cord will be replaced between measurements.

6.3.3 Well Evacuation

Standing water in the wells will be removed prior to sampling by purging until: (1) at least three well volumes have been removed; (2) the well yields low turbidity water; and (3) consistent values of temperature, pH, and specific conductance are achieved. If the well goes dry before three well volumes have been removed, samples will be taken as soon as the well recovers. The calculation of well volume will be as follows:

- ▶ The well casing inside diameter will be measured;
- ▶ The static water level below the measuring point will be determined;
- ▶ The total depth of the well will be identified from the measuring point;
- ▶ The number of linear feet of static water will be calculated as the total depth of the well minus the static water level; and
- ▶ The static volume (well volume) will be calculated in gallons as:

$$V = (\pi r^2)(h)(7.48)$$

Where:

V = well volume (gal)

$\pi = 3.14$

r = well radius (ft)

h = linear feet of static water (ft)

Dedicated Teflon or stainless steel bailers will be used for purging and sampling the wells. Purged water will be placed in containers for subsequent handling and disposal in accordance with Federal, state, and local regulations based upon the results of chemical analysis. Bailers, pumps, and all other equipment shall be decontaminated prior to insertion into the well. Decontamination will consist of steam cleaning or washing with a detergent such as Alconox, rinsing with methanol, and rinsing three times with distilled water. Bailer ropes and sampling gloves will be discarded after sampling each well.

6.3.4 Groundwater Sampling

During sampling, special care will be taken to avoid physically altering or chemically contaminating the sample volumes. Sampling of onsite till wells will not occur until the SVE system has been shut down, and till waters have been given sufficient time to stabilize as described in Section 6.3.3.

Sampling will be performed with bottom-filling Teflon or stainless steel bailers. Subsurface water pH, specific conductance, and temperature will be determined in the field on secured samples. Sample volumes will be collected in the following order:

- ▶ Volatile organics;
- ▶ Base neutral/acid extractable organics;
- ▶ Polychlorinated biphenyls (PCBs);
- ▶ Metals; and
- ▶ Cyanide.

Samples of subsurface water will be prepared, preserved, and stored as described in Section 7.0. All sampling equipment will be decontaminated between samples following the procedures in Table 6-1.

The objective of the subsurface water sampling for the metals and PCBs shown in Table 4-3 is to determine the concentration of dissolved constituents. Therefore, subsurface water

samples for metals and PCB analyses will be filtered through a nonmetallic 0.45-micron pore size membrane immediately after collection. One of the following apparatus will be used for field filtration: (1) a Sartorius filtration apparatus or (2) a Nalgene filtration apparatus. If necessary, the sample may be pumped through the filter using a Nalgene hand vacuum pump. The first 150 to 200 ml of filtrate will be used to rinse the filtration apparatus of any contaminants. This technique minimizes the risk of altering the composition of the samples by the filtering operation. The filtrate for metals analysis will be collected in a polyethylene bottle and immediately acidified to a pH <2 using nitric acid. The filtrate for chromium VI analysis will not be acidified. The filtrate for PCB analysis will be collected in amber glass bottles.

One field blank sample will be collected for each group of 10 or fewer samples. Equipment in safe blank samples will be prepared immediately after collection of a field sample by pouring distilled water through a decontaminated bailer into the appropriate sample container. Preparation of the field blank will occur onsite.

One field duplicate sample will be obtained for each group of 10 or fewer compliance samples.

Matrix spike/matrix spike duplicate (MS/MSD) samples will be collected at a frequency of one per group of 20 or fewer compliance samples designated for organics analysis.

Trip blank samples will be provided by the laboratory selected to perform volatile organic analysis at a frequency of one per shipping container of samples.

6.4 Surface Water

The surface water will be monitored by sampling the unnamed ditch just upstream and just downstream of the ECC Site (Figure 4-1). To collect a surface water sample, the sample container will be submerged in the water, removed, and immediately capped. The container mouth will be positioned so that it faces upstream, while the sampling personnel are standing downstream to prevent the stirring up of any sediments that would contaminate the sample. Downstream samples will be collected first moving upstream. Quality control samples (field blanks, field duplicates, and MS/MSD samples) will be collected at the same frequency as specified for subsurface water samples. Decontamination of sampling equipment will consist of

washing with a detergent such as Alconox, rinsing with methanol, and rinsing three times with distilled water.

Table 7-1. Sample Containers, Preservatives, and Holding Times

Analysis	Container Type	Preservation and Storage Requirements	Maximum Holding Time
Soil-VOC	Two 8-ounce glass jars ^(a)	4°C; protect from light	14 days
Soil-1,2-Dichlorobenzene Phenol	Two 8-ounce glass jars ^(a)	4°C; protect from light	14/40 days ^(b)
Water-VOCs	Three 40-mL glass vials ^(a)	HCl to pH ≤ 2; 4°C; protect from light	14 days
Water-BNAs	Two 1-liter amber glass jars ^(a)	4°C; protect from light	7/40 days ^(b)
Water-PCBs	Two 1-liter amber glass jars ^(a)	4°C; protect from light	7/40 days ^(b)
Water-Metals	One 1-liter poly bottle ^(a)	HNO ₃ to pH ≤ 2; 4°C; protect from light	6 months (Mercury = 28 days)
Water-Chromium VI (CR +6)	One 1-liter poly bottle ^(a)	4°C; protect from light	24 hours
Water-Alkalinity	One 250-mL poly bottle ^(a)	4°C	14 days
Water-TDS	One 250-mL poly bottle ^(a)	4°C	7 days
Water-TSS	One 250-mL poly bottle ^(a)	4°C	7 days
Water-Cyanide	One 500-mL poly bottle ^(a)	NaOH to pH > 4°C	14 days
^(a) Teflon-lined cap or septa ^(b) Days to extraction/days of analysis			

**QUALITY ASSURANCE PROJECT PLAN
VOLUME II**

FIELD SAMPLING PLAN

**Addendum No.1
Background Sampling of Unnamed Ditch**

March 7, 1997

NSL Drainage Channel

U.S. EPA and the Trustees have concluded that the west-central surface water drainage channel from Northside Sanitary Landfill (NSL) (constructed as part of the remedial action for that site) represents an "upstream surface water concentration" as defined in Table 3-1 of Exhibit A. This contribution to Unnamed Ditch must be accounted for in the surface water sampling plan for the Enviro-Chem Superfund Site (the "ECC Site"). This document outlines the procedures that are proposed to properly account for the NSL west-central surface water input to Unnamed Ditch at the ECC Site. This procedure will supplement the activities described in Exhibit A and the Field Sampling Plan (FSP) for monitoring surface water quality which consists of collecting samples from Unnamed Ditch upgradient and downgradient of the ECC Site. The NSL west-central drainage channel (the "NSL Channel") is directed to Unnamed Ditch between the upgradient and downgradient sampling locations. The sampling locations proposed for this sampling plan are indicated as SW-1 (upgradient), SW 2 (downgradient), and NSL-1 (NSL Channel) on Figure 1, included as Attachment 1 to this Addendum.

Background Determination

To assess the NSL Channel and any upgradient impact, 12 grab samples will be collected manually from SW-1 and NSL-1 during wet weather¹. These samples will be collected during at least six storm events over a 12-month period. Sampling analysis will be performed in accordance with the analytical methods summarized in Table 7-1 of the Quality Assurance Project Plan.

Flow rates will be measured at NSL-1 during each sampling event. In the event that direct flow rate measurement is not practical, flow rates will be estimated by using one of the methods described in Section 3 of the NPDES Storm Water Sampling Guidance Document², or by using a salt-dilution tracer such as lithium chloride injected at a known rate upgradient of individual sampling locations. Rainfall intensity will be obtained from an on-site rain gauge³, and a

¹ A description of sampling methodology is included as Attachment 2.

² United States Environmental Protection Agency. 1992. *NPDES Storm Water Sampling Guidance Document*. Office of Water, Washington, D.C. Publication number EPA 833-B-92-001.

³ A rain gauge will be periodically monitored to obtain data on the rainfall intensity as a function of time; however, rainfall intensity will not be continuously recorded.

relationship will be established between rainfall intensity and flow at NSL-1 for use in the compliance monitoring.

An attempt will be made to limit sampling events to representative storm events as established in the *NPDES Storm Water Sampling Guidance Document*. The criteria for determining a representative storm event indicate that (1) the storm must result in greater than 0.1 inch accumulation; (2) the storm must be preceded by at least 72 hours of dry weather, and (3) where feasible, the depth of rain and duration of the event should not vary by more than 50% from the average depth and duration.

For each parameter, the analytical results from the 12 samples will be analyzed using standard statistical procedures. The mean and standard deviation will be calculated, and all nondetects will be assigned a value equal to $\frac{1}{2}$ the EPA-approved quantification limit. Applicable surface water background concentrations will be calculated as two standard deviations above the calculated mean of these 12 samples. Equation 2 in Attachment 3 estimates the mass contribution from background.

Compliance Monitoring

The determination that the ECC Site is contributing contamination to Unnamed Ditch will be calculated based on discharge flow rates and pollutant concentrations. Surface water compliance monitoring will be conducted at the frequency described in Section 2.1.5 of Exhibit A. Using the same procedures described in this document, grab samples will be collected from SW-1 and SW-2, and flow measurements will be collected from SW-1. If sampling occurs during a rain event, flow for the NSL Channel will be estimated using rainfall intensity and the relationship established during background sampling. Because flow contribution from the ECC Site will be negligible, flow at SW-2 will be estimated as the sum of flows at SW-1 and NSL-1. Mass balance equations for compliance determination are included as Attachment 3. Equation 1 will be used to determine the contribution of contaminants, if any, from the ECC site. In the event that the applicable background concentration for any parameter is higher than the stream concentration presented in Table 3-1 of Exhibit A, then those higher background concentrations will constitute the Acceptable Stream Concentrations for the purpose of compliance determination.

Bankert Farms Landfill Leachate

Because the Bankert Farms landfill is located upgradient from the ECC site, its impact on surface water quality should be accounted for by the background samples at SW-1⁴. However, grab samples at SW-1 will be collected and analyzed during compliance monitoring to detect any upstream impact that is uncharacteristically higher than the value established during the background determination. In the event that analytical results indicate that the Bankert Farms landfill impact on Unnamed Ditch is not accurately represented by such samples, further evaluation may be required.

⁴A copy of the IDEM inspection report identifying the leachate seeps is included as Attachment 4.

ADDENDUM NO. 1

ATTACHMENT 1
SURFACE WATER SAMPLING LOCATIONS



ADDENDUM NO. 1

**ATTACHMENT 2
SAMPLING METHODOLOGY**

**SURFACE WATER SAMPLING PROCEDURES
ENVIRO-CHEM SUPERFUND SITE**

Samples will be collected from the furthest downgradient location first proceeding in order to the furthest upgradient location.

Samples of surface water will be collected at each location using a dipper type sampling device. The bucket will be decontaminated between each sampling location using an alconox wash followed by a triple distilled water rinse. The sample will be collected from the horizontal and vertical center of the channel and care will be taken so as not to disturb sediment in the ditch. The dipper sampling device will be filled with the opening facing upstream, however, uncharacteristic floating debris will not be included as sample. The sample will be transferred to laboratory supplied containers that contain the appropriate preservatives in the following order:

- 1) Volatile organic compounds
- 2) Basic neutral/acid extractables
- 3) Polychlorinated biphenyls
- 4) Inorganic parameters

The filled sample containers will be placed in an insulated cooler with ice and transferred to the laboratory under chain-of-custody procedures.

ADDENDUM NO. 1

ATTACHMENT 3
MASS BALANCE EQUATIONS

Compliance Determination

$$Q'_{sw2} C'_{sw2} \leq \{Q'_{sw2} \times [ASC]\} \text{ or } \{M'_{BG}\}$$

$$C'_{sw2} \leq \text{the greater of the following values: } [ASC] \text{ or } \left[\frac{M'_{BG}}{Q'_{sw2}} \right] \quad \text{Equation 1}^1$$

Determination of Background (M'_{BG})

$$M'_{BG} = M'_{sw1} + M'_{NSL}$$

Equation 2

Where:

$$M'_{sw1} = Q'_{sw1} \bar{C}_{sw1}$$

$$M'_{NSL} = Q'_{NSL} \bar{C}_{NSL}$$

Description of Terms

C'_{sw2}	=	Concentration of a given compound at sampling time = t; location = SW-2.
Q'_{sw2}	=	Volumetric flow rate of Unnamed Ditch at sampling time = t; location = SW-2.
M'_{BG}	=	Estimated mass contribution of a given compound from background at sampling time = t.
ASC	=	Acceptable Stream Concentration as defined in Table 3-1 of Exhibit A.
M'_{sw2}	=	Mass of a given compound at sampling time = t; location = SW-2.
M'_{sw1}	=	Estimated mass of a given compound at sampling time = t; location = SW-1.
Q'_{sw1}	=	Volumetric flow rate of Unnamed Ditch at sampling time = t; location = SW-1.
\bar{C}_{sw1}	=	Applicable background concentration at SW-1, statistically calculated as two standard deviations above the mean of the 12 background samples.

¹ Prior to this document, Equation 1 would be represented as

$C'_{sw2} \leq \text{the greater of the following values: } [ASC] \text{ or } [C'_{sw1}]$. The term $\left[\frac{M'_{BG}}{Q'_{sw2}} \right]$ accounts for additional contribution from the NSL Channel.

- M'_{NSL} = Estimated mass of a given compound at sampling time = t ; location = NSL-1.
- Q'_{NSL} = Flow contribution from Northside Sanitary Landfill estimated based on the relationship established with rainfall intensity.
- C_{NSL} = Applicable background concentration at NSL-1, statistically calculated as two standard deviations above the mean of the 12 background samples.

APPENDIX B

Field Measurements and Purge Data

TABLE B-1
ECC Site Background Well No T-5
Field Measurements and Purge Data
August - December 1998

[illegible]

TABLE B-2
ECC Site Background Well No S-1
Field Measurements and Purge Data
September 1998 - July 1999

[illegible]

TABLE B-3
ECC Site Background Surface Water Sampling
Field Measurements
November 1998 - March 2000

[illegible]

APPENDIX C

Quality Assurance Quality Control Sample Results

TABLE C-1
Analytical Results for Background Trip Blanks
Quality Assurance / Quality Control Samples
ECC Superfund Site - Zionsville, Indiana
(Page 1 of 4)

TYPE ENVIRON SAMPLE ID COLLECTION DATE	TRIP BLANK TB01-980901 August-98	TRIP BLANK TB01-980925 September-98	TRIP BLANK TB-981023 October-98	TRIP BLANK ECTGW5-01 T November-98	TRIP BLANK ECSGW4D-01 T November-98
Volatile Organic Compounds					
1,1,1-Trichloroethane	1.0 U	1.0 U	5.0 U	0.5 U	0.5 U
1,1,2-Trichloroethane	1.0 U	1.0 U	5.0 U	0.5 U	0.5 U
1,1-Dichloroethene	1.0 U	1.0 U	5.0 U	0.5 U	0.5 U
1,2-Dichloroethene (total)	1.0 U	1.0 U	5.0 U	0.5 U	0.5 U
Acetone	10.0 U	NA	NA	0.5 U	3.0 B
Ethylbenzene	1.0 U	1.0 U	5.0 U	0.5 U	0.5 U
Methyl ethyl ketone	10.0 U	NA	NA	2.0 U	2.0 U
Methyl Isobutyl ketone	10.0 U	NA	NA	2.0 U	2.0 U
Methylene chloride	5.0 U	5.0 U	5.0 U	3.0 B	2.0 B
Tetrachloroethene	1.0 U	1.0 U	5.0 U	2.0	0.5 U
Toluene	1.0 U	1.0 U	5.0 U	0.4 JB	0.5 U
Trichloroethene	1.0 U	1.0 U	5.0 U	2.0	0.5 U
Vinyl chloride	5.0 U	5.0 U	10.0 U	0.5 U	0.5 U
Xylenes (total)	1.0 U	NA	NA	0.5 U	0.5 U

Notes:

All concentrations are in ug/L.

B - Analyte was also detected in the associated laboratory method blank.

U - Compound not detected above adjacent method detection limit.

NA - Not Analyzed.

J - Estimated value.

TABLE C-1
Analytical Results for Background Trip Blanks
Quality Assurance / Quality Control Samples
ECC Superfund Site - Zionsville, Indiana
(Page 2 of 4)

TYPE ENVIRON SAMPLE ID COLLECTION DATE	TRIP BLANK TB01-981207 December-98	TRIP BLANK TRIP BLANK March-99	TRIP BLANK TB01-990318 March-99	TRIP BLANK TB1-990415 April-99	TRIP BLANK TRIP BLANK April-99
Volatile Organic Compounds					
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.6 B
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloroethene (total)	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Acetone	2.0 B	NA	NA	2.0 U	2.0 U
Ethylbenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methyl ethyl ketone	2.0 U	NA	NA	2.0 U	2.0 U
Methyl Isobutyl ketone	2.0 U	NA	NA	2.0 U	2.0 U
Methylene chloride	1.0 B	0.6 B	1.0	0.8	0.5 U
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Xylenes (total)	NA	NA	NA	0.5 U	0.5 U

Notes:

All concentrations are in ug/L.

B - Analyte was also detected in the associated laboratory method blank.

U - Compound not detected above adjacent method detection limit.

NA - Not Analyzed.

TABLE C-1
Analytical Results for Background Trip Blanks
Quality Assurance / Quality Control Samples
ECC Superfund Site - Zionsville, Indiana
(Page 3 of 4)

TYPE ENVIRON SAMPLE ID COLLECTION DATE	TRIP BLANK TB01 May-99	TRIP BLANK ECTB May-99	TRIP BLANK TB-01990630 June-99	TRIP BLANK TB-990714 July-99	TRIP BLANK ECTB1-04 August-99
Volatile Organic Compounds					
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloroethene (total)	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Acetone	2.0 U	2.0 U	4.0 B	NA	3.0
Ethylbenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methyl ethyl ketone	2.0 U	2.0 U	2.0 U	NA	1.0 J
Methyl Isobutyl ketone	2.0 U	2.0 U	2.0 U	NA	1.0 J
Methylene chloride	0.5 B	0.7 B	2.0	0.9 B	0.8
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	0.5 U	0.5 U	0.4 J	0.5 U	0.5 U
Trichloroethene	0.5 U	2.0	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Xylenes (total)	0.5 U	0.5 U	0.5 U	NA	0.5 U

Notes:

All concentrations are in ug/L.

B - Analyte was also detected in the associated laboratory method blank.

U - Compound not detected above adjacent method detection limit.

NA - Not Analyzed.

J - Estimated value.

TABLE C-1
Analytical Results for Background Trip Blanks
Quality Assurance / Quality Control Samples
ECC Superfund Site - Zionsville, Indiana
(Page 4 of 4)

TYPE ENVIRON SAMPLE ID COLLECTION DATE	TRIP BLANK ECTB1-05 November-99	TRIP BLANK ECTB3-05 November-99	TRIP BLANK TB01-000210 February-00	TRIP BLANK TB01-000309 March-00
Volatile Organic Compounds				
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloroethene (total)	0.5 U	0.5 U	0.5 U	0.5 U
Acetone	2.0 J	NA	NA	NA
Ethylbenzene	0.5 U	0.5 U	0.5 U	0.5 U
Methyl ethyl ketone	2.0 J	NA	NA	NA
Methyl Isobutyl ketone	2.0 U	NA	NA	NA
Methylene chloride	2.0	1.0	2.0	1.0 B
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	0.5 U	0.2 J	0.5 U	0.3 J
Trichloroethene	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U
Xylenes (total)	0.5 U	NA	NA	NA

Notes:

All concentrations are in ug/L.

B - Analyte was also detected in the associated laboratory method blank.

U - Compound not detected above adjacent method detection limit.

NA - Not Analyzed.

J - Estimated value.

TABLE C-2
Analytical Results for Field Blank Samples
Quality Assurance / Quality Control Samples
ECC Superfund Site - Zionsville, Indiana
(Page 1 of 8)

TYPE ENVIRON SAMPLE ID COLLECTION METHOD COLLECTION DATE	FIELD BLANK WB01-980901 PUMP August-98	FIELD BLANK WB01-980925 PUMP September-98	FIELD BLANK WB01-981026 PUMP October-98	FIELD BLANK ECTGW8-01 B BAILER November-98	FIELD BLANK ECSGW4-01 B PUMP November-98
Volatile Organic Compounds					
Acetone				9 U	4 B
1,1-Dichloroethene	1 U	1 U	5 U	0.5 U	0.5 U
1,2-Dichloroethene (total)	1 U	1 U	5 U	0.5 U	0.5 U
Ethylbenzene	1 U	1 U	5 U	0.5 U	0.5 U
Methyl ethyl ketone	NA	NA	NA	2 U	2 U
Methyl Isobutyl ketone	NA	NA	NA	2 U	2 U
Methylene chloride	5 U	17	5 U	3 B	2 B
Tetrachloroethene	1 U	1 U	5 U	0.5 U	0.5 U
Toluene	1 U	1 U	5 U	0.5 U	0.5 U
Trichloroethene	1 U	1 U	5 U	0.5 U	0.5 U
1,1,1-Trichloroethane	1 U	1 U	5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	1 U	1 U	5 U	0.5 U	0.5 U
Vinyl chloride	5 U	5 U	10 U	0.5 U	0.5 U
Xylenes (total)	NA	NA	NA	0.5 U	0.5 U
Semi-Volatile Organic Compounds					
Bis (2-ethylhexyl) phthalate	2.5 U	2.5 U	2.5 U	10 U	10 U
Di-n-butyl phthalate	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U
Diethyl phthalate	10 U	10 U	10 U	10 U	10 U
Isophorone	NA	NA	NA	10 U	10 U
Naphthalene	10 U	10 U	10 U	10 U	10 U
Phenol	10 U	10 U	10 U	10 U	10 U

Notes: All concentrations are in ug/L.
 B - Analyte was also detected in the associated laboratory method blank.
 U - Compound not detected above adjacent method detection limit.
 NA - Not Analyzed.

TABLE C-2
Analytical Results for Field Blank Samples
Quality Assurance / Quality Control Samples
ECC Superfund Site - Zionsville, Indiana
(Page 2 of 8)

TYPE ENVIRON SAMPLE ID COLLECTION METHOD COLLECTION DATE	FIELD BLANK WB01-980901 PUMP August-98	FIELD BLANK WB01-980925 PUMP September-98	FIELD BLANK WB01-981026 PUMP October-98	FIELD BLANK ECTGW8-01 B BAILER November-98	FIELD BLANK ECSGW4-01 B PUMP November-98
Inorganics					
Antimony	100 U	NA	NA	1.7 U	1.7 U
Arsenic	20 U	20 U	20 U	1.7 U	1.7 U
Barium	10 U	NA	NA	0.58 B	0.4 U
Beryllium	5 U	NA	NA	0.2 U	0.39 B
Cadmium	5 U	NA	NA	1 U	1 U
Chromium VI	10 U	10 U	10 U	10 U	10 U
Lead	50 U	50 U	50 U	0.7 U	0.7 U
Manganese	10 U	NA	NA	0.2 U	0.93 E
Nickel	10 U	10 U	10 U	0.7 U	0.7 U
Silver	100	NA	NA	0.4 U	0.4 U
Tin	50 U	NA	NA	4.7 U	4.7 U
Vanadium	50 U	10 U	10 U	0.4 U	0.4
Zinc	10 U	NA	NA	1.5 U	1.5 U
Cyanide (total)	5 U	6	5 U	10 U	10 U
Polychlorinated biphenyls					
Aroclor 1016	0.5 U	0.5 U	0.5 U	0.95 U	1 U
Aroclor 1221	0.5 U	0.5 U	0.5 U	1.9 U	2 U
Aroclor 1232	0.5 U	0.5 U	0.5 U	0.95 U	1 U
Aroclor 1242	0.5 U	0.5 U	0.5 U	0.95 U	1 U
Aroclor 1248	0.5 U	0.5 U	0.5 U	0.95 U	1 U
Aroclor 1254	0.5 U	0.5 U	0.5 U	0.95 U	1 U
Aroclor 1260	0.5 U	0.5 U	0.5 U	0.95 U	1 U

Notes: All concentrations are in ug/L.

B - Analyte value is < contract required detection limit but > = instrument detection limit.

U - Compound not detected above adjacent method detection limit.

NA - Not Analyzed.

TABLE C-2
Analytical Results for Field Blank Samples
Quality Assurance / Quality Control Samples
ECC Superfund Site - Zionsville, Indiana
(Page 3 of 8)

TYPE ENVIRON SAMPLE ID COLLECTION METHOD COLLECTION DATE	FIELD BLANK WB01-981207 PUMP December-98	FIELD BLANK WB01990112 PUMP January-99	FIELD BLANK ECTGW5-02-B BAILER February-99	FIELD BLANK ESCGW4A02B PUMP February-99	FIELD BLANK WB01-990318 PUMP March-99
Volatile Organic Compounds					
Acetone	4 B	4	2 U	2 U	NA
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloroethene (total)	0.5 U	0.5 U	0.5 U	0.3 J	0.5 U
Ethylbenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methyl ethyl ketone	2 U	2 U	2 U	2 U	NA
Methyl isobutyl ketone	2 U	NA	2 U	2 U	NA
Methylene chloride	0.7 B	1 B	0.6 JB	9 B	0.9 U
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	NA
Toluene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene	0.5 U	0.5 U	0.3 J	1	0.5 U
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Xylenes (total)	0.5 U	0.5 U	0.5 U	0.5 U	NA
Semi-Volatile Organic Compounds					
Bis (2-ethylhexyl) phthalate	9 U	10 U	10 U	10 U	10 U
Di-n-butyl phthalate	9 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	9 U	10 U	10 U	10 U	10 U
Diethyl Phthalate	9 U	10 U	10 U	10 U	10 U
Isophorone	9 U	10 U	10 U	10 U	10 U
Naphthalene	9 U	10 U	10 U	10 U	10 U
Phenol	9 U	10 U	10 U	10 U	10 U

Notes: All concentrations are in ug/L.
 B - Analyte was also detected in the associated laboratory method blank.
 U - Compound not detected above adjacent method detection limit.
 NA - Not Analyzed.

TABLE C-2
Analytical Results for Field Blank Samples
Quality Assurance / Quality Control Samples
ECC Superfund Site - Zionsville, Indiana
(Page 4 of 8)

TYPE ENVIRON SAMPLE ID COLLECTION METHOD COLLECTION DATE	FIELD BLANK WB01-981207 PUMP December-98	FIELD BLANK WB01990112 PUMP January-99	FIELD BLANK ECTGW5-02-B BAILER February-99	FIELD BLANK ESCGW4A02B PUMP February-99	FIELD BLANK WB01-990318 PUMP March-99
Inorganics					
Antimony	1.7 U	1.7 B	2.4 B	1 U	NA
Arsenic	1.7 U	1.7 U	1.4 U	1.4 U	1.4 U
Barium	0.4 U	0.4 U	36.3	0.2 U	NA
Beryllium	0.52 B	0.2 U	0.5 U	0.5 B	NA
Cadmium	1 U	1 U	0.2 U	0.2 B	NA
Chromium VI	10 U	U	10 U	10 U	NA
Lead	0.7 U	0.7 U	2.2 B	2.1 B	0.7 U
Manganese	1.2 B	0.61 B	0.4 B	3.4 B	NA
Nickel	0.7 U	0.7 U	0.8 U	0.8 U	1.5 B
Silver	0.4 U	0.4 U	0.4 U	0.4 U	NA
Tin	4.7 U	4.7 U	2.7 U	2.7 U	NA
Vanadium	0.41 B	0.4 U	0.5 U	0.5 U	NA
Zinc	6.9 B	1.5 U	0.8 U	3.3 B	0.8 U
Cyanide (total)	10 U	10 U	10 U	10 U	7.7 U
Polychlorinated biphenyls					
Aroclor 1016	0.98 U	1 U	0.48 U	0.47 U	0.48 U
Aroclor 1221	2 U	2 U	1.0 U	0.9 U	0.95 U
Aroclor 1232	0.98 U	1 U	0.48 U	0.47 U	0.48 U
Aroclor 1242	0.98 U	1 U	0.48 U	0.47 U	0.48 U
Aroclor 1248	0.98 U	1 U	0.48 U	0.47 U	0.48 U
Aroclor 1254	0.98 U	1 U	0.48 U	0.47 U	0.48 U
Aroclor 1260	0.98 U	1 U	0.48 U	0.47 U	0.48 U

Notes: All concentrations are in ug/L.

B - Analyte value is < contract required detection limit but > = instrument detection limit.

U - Compound not detected above adjacent method detection limit.

NA - Not Analyzed.

J - Estimated value.

TABLE C-2
Analytical Results for Field Blank Samples
Quality Assurance / Quality Control Samples
ECC Superfund Site - Zionsville, Indiana
(Page 5 of 8)

TYPE ENVIRON SAMPLE ID COLLECTION METHOD COLLECTION DATE	FIELD BLANK WB01-990420 PUMP April-99	FIELD BLANK ECSGW-03B PUMP May-99	FIELD BLANK ECTGW-10B BAILER May-99	FIELD BLANK ECSGW114B PUMP July-99	FIELD BLANK ECSGWM1304B PUMP August-99
Volatile Organic Compounds					
Acetone	2 U	2 U	2 U	NA	2.0 JB
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloroethene (total)	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methyl ethyl ketone	2 U	2 U	2 U	NA	2.0 U
Methyl isobutyl ketone	2 U	2 U	2 U	NA	2.0 U
Methylene chloride	0.7 B	1	0.4 JB	0.4 JB	0.5 U
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene	0.5 U	1	0.5 U	0.5 U	0.5 U
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Xylenes (total)	0.5 U	0.5 U	0.5 U	NA	0.5 U
Semi-Volatile Organic Compounds					
Bis (2-ethylhexyl) phthalate	10 U	10 U	NA	10 U	10 U
Di-n-butyl phthalate	10 U	10 U	NA	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	NA	10 U	10 U
Diethyl phthalate	10 U	10 U	NA	10 U	10 U
Isophorone	10 U	10 U	NA	10 U	10 U
Naphthalene	10 U	10 U	NA	10 U	10 U
Phenol	10 U	10 U	NA	10 U	10 U

Notes: All concentrations are in ug/L.

B - Analyte was also detected in the associated laboratory method blank.

U - Compound not detected above adjacent method detection limit.

NA - Not Analyzed.

TABLE C-2
Analytical Results for Field Blank Samples
Quality Assurance / Quality Control Samples
ECC Superfund Site - Zionsville, Indiana
(Page 6 of 8)

TYPE ENVIRON SAMPLE ID COLLECTION METHOD COLLECTION DATE	FIELD BLANK WB01-990420 PUMP April-99	FIELD BLANK ECSGW-03B PUMP May-99	FIELD BLANK ECTGW-10B BAILER May-99	FIELD BLANK ECSGW114B PUMP July-99	FIELD BLANK ECSGWM1304B PUMP August-99
Inorganics					
Antimony	1.9 B	1 U	1 U	NA	1.9 B
Arsenic	1.4 U	1.4 U	1.4 U	2.0 U	2.0 U
Barium	45	0.1 U	11.7	NA	0.2 U
Beryllium	0.1 U	0.39 B	0.35 B	NA	0.1 B
Cadmium	0.2 U	0.29 B	0.2 U	NA	0.5 U
Chromium VI	U	10 U	10 U	NA	10 U
Lead	1.1 B	1 U	1 U	1.0 U	1.0 U
Manganese	0.26 B	0.1 U	0.24 B	NA	0.6 B
Nickel	0.5 U	0.5 U	0.5 U	1.0 U	1 U
Silver	4 U	0.4 U	0.4 U	NA	0.33 B
Tin	2 U	2 U	2 U	NA	4.2 U
Vanadium	0.41 B	0.4 U	0.4 U	NA	0.6 U
Zinc	0.4 U	0.4 U	0.4 U	1.1 U	1.1 U
Cyanide (total)	4.7 U	4.7 U	4.7 U	2.8 U	2.8 U
Polychlorinated biphenyls					
Aroclor 1016	0.54 U	0.54 U	0.48 U	0.5 U	0.53 U
Aroclor 1221	1.1 U	1.1 U	0.97 U	1 U	1.0 U
Aroclor 1232	0.54 U	0.54 U	0.48 U	0.5 U	0.53 U
Aroclor 1242	0.54 U	0.54 U	0.48 U	0.5 U	0.53 U
Aroclor 1248	0.54 U	0.54 U	0.48 U	0.5 U	0.53 U
Aroclor 1254	0.54 U	0.54 U	0.48 U	0.5 U	0.53 U
Aroclor 1260	0.54 U	0.54 U	0.48 U	0.5 U	0.53 U

Notes: All concentrations are in ug/L.

B - Analyte value is < contract required detection limit but > = instrument detection limit.

U - Compound not detected above adjacent method detection limit.

NA - Not Analyzed.

J - Estimated value.

TABLE C-2
Analytical Results for Field Blank Samples
Quality Assurance / Quality Control Samples
ECC Superfund Site - Zionsville, Indiana
(Page 7 of 8)

TYPE ENVIRON SAMPLE ID COLLECTION METHOD COLLECTION DATE	FIELD BLANK ECTGW9-04B PUMP August-99	FIELD BLANK ECSGW1-05B PUMP November-99	FIELD BLANK ECTGW1-05-B BAILER November-99	
Volatile Organic Compounds				
Acetone	2.0 JB	NA	4	
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	
1,2-Dichloroethene (total)	0.5 U	0.5 U	0.5 U	
Ethylbenzene	0.5 U	0.5 U	0.5 U	
Methyl ethyl ketone	2.0 U	NA	1 J	
Methyl Isobutyl ketone	2.0 U	NA	0.3 J	
Methylene Chloride	0.5 U	2	2	
Tetrachloroethene	0.5 U	0.5 U	0.5 U	
Toluene	0.5 U	0.2 J	0.5 U	
Trichloroethene	0.5 U	0.5 U	0.5 U	
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	
Vinyl Chloride	0.5 U	0.5 U	0.5 U	
Xylenes (total)	0.5 U	NA	0.5 U	
Semi-Volatile Organic Compounds				
Bis (2-ethylhexyl) phthalate	10 U	10 U	10 U	
Di-n-butyl phthalate	10 U	10 U	10 U	
1,2-Dichlorobenzene	10 U	10 U	10 U	
Diethyl phthalate	10 U	10 U	10 U	
Isophorone	10 U	NA	NA	
Naphthalene	10 U	10 U	10 U	
Phenol	10 U	10 U	10 U	

Notes: All concentrations are in ug/L.

B - Analyte was also detected in the associated laboratory method blank.

U - Compound not detected above adjacent method detection limit.

NA - Not Analyzed.

J - Estimated value.

TABLE C-2
Analytical Results for Field Blank Samples
Quality Assurance / Quality Control Samples
ECC Superfund Site - Zionsville, Indiana
(Page 8 of 8)

TYPE ENVIRON SAMPLE ID COLLECTION METHOD COLLECTION DATE	FIELD BLANK ECTGW9-04B PUMP August-99	FIELD BLANK ECSGW1-05B PUMP November-99	FIELD BLANK ECTGW1-05-B BAILER November-99
Inorganics			
Antimony	2.2 B	NA	4.4 B
Arsenic	2.0 U	7.6 U	7.6 U
Barium	16.8	NA	0.35 B
Beryllium	0.1 B	NA	0.33 B
Cadmium	0.5 U	NA	0.3 U
Chromium VI	10 U	10 U	10 U
Lead	1.0 U	1.5 U	1.5 U
Manganese	0.4 B	NA	2.3 B
Nickel	1.1 B	1.4 U	1.1 U
Silver	0.3 U	NA	1.1 B
Tin	4.2 U	NA	3.6 U
Vanadium	0.6 U	NA	0.93 B
Zinc	1.1 U	3.1 U	3.1 U
Cyanide (total)	2.8 U	8.2 U	8.2 U
Polychlorinated biphenyls			
Aroclor 1016	0.5 U	0.5 U	0.49 U
Aroclor 1221	1.0 U	1 U	0.91 U
Aroclor 1232	0.5 U	0.5 U	0.49 U
Aroclor 1242	0.5 U	0.5 U	0.49 U
Aroclor 1248	0.5 U	0.5 U	0.49 U
Aroclor 1254	0.5 U	0.5 U	0.49 U
Aroclor 1260	0.5 U	0.5 U	0.49 U

Notes: All concentrations are in ug/L.

B - Analyte value is < contract required detection limit but > = instrument detection limit.

U - Compound not detected above adjacent method detection limit.

NA - Not Analyzed.



CH2MHILL

CH2M HILL

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February 22, 2001

160532.RP.03

Mr. Michael McAteer, WAM (5HSRL-6J)
U.S. Environmental Protection Agency, Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Subject: CH2M HILL Oversight Comments on Environ's Background Surface and
Subsurface Water Monitoring Report for ECC Superfund Site, Zionsville, IN
WA No. 114-RXBF-0530; Enviro-Chem-OU 1, IN

Dear Mike:

Attached are CH2M HILL's comments on the subject document. Please call me if you have
any questions at (937) 228-3180 (ext. 213).

Sincerely,

CH2M HILL

Timothy D. Harrison, P.E.

DAY\ECC Background Comments Cover Letter.doc
Enclosure

cc: Stephen Nathan, PO/U.S. EPA, Region 5 (w/o enclosure)
Dave Alberts, CO/U.S. EPA, Region 5 (w/o enclosure)
Ike Johnson, PM/CH2M HILL, Milwaukee
Dan Plomb, DPM/CH2M HILL, Milwaukee
Lauri Gorton, QAM/CH2M HILL, Milwaukee
Al Erickson, RTL/CH2M HILL, Milwaukee
Cherie Wilson, AA/CH2M HILL, Milwaukee

CH2M HILL Review Comments on Environ's *Background Surface and Subsurface Water Monitoring Report*

EnviroChem Superfund Site in Zionsville, Indiana

TO: Michael McAteer/USEPA Region 5

FROM: Dan MacGregor/CH2M HILL-MKE
Tim Harrison/CH2M HILL-DAY

DATE: February 22, 2001

The purpose of this memorandum is to present CH2M HILL's oversight review comments on the subject document. Environ's report presents the background subsurface and surface water sample results and the EnviroChem Trust's (Trust) approach to amending "Background Acceptable Concentrations" using methodology outlined in Revised Exhibit A of the EnviroChem consent decree.

The subject report presents the Trust's approach to modifying "Applicable Subsurface and Surface Water" concentrations for the site based on the results of "background well and surface water" sampling. The methodology used by the Trust to develop modified applicable concentrations is prescribed in Revised Exhibit A of the Consent Decree (Footnotes 2 and 4 of Table 3-1). This process was included in the Consent Decree to allow the EnviroChem Trust to adjust Acceptable Concentrations to account for local water quality conditions. The concern was that potential upstream/upgradient sources (e.g., Boon County Recycling) might degrade the water quality making it more difficult to clean up EnviroChem to meet Acceptable Concentrations.

The primary steps of the protocol used by the Trustees in the analysis are:

- Collect twelve background (i.e., upstream) surface and twelve background (i.e., upgradient) subsurface samples over a period of at least 12 months.
- Perform statistical analysis on the analytical results of the twelve samples. The applicable revised concentration is defined as two standard deviations above the calculated mean of the 12 samples.

Table 1 presents the "Acceptable Concentrations" proposed by the EnviroChem Trust compared to the current values from Exhibit A Table 3-1. Note that some of the values increased significantly.

General Comments

The intent of the background sampling provision and statistical determination incorporated in Revised Exhibit A is to account for the potential influence of water quality from potential upgradient/upstream sources. The background sampling, with a few exceptions, shows that background contamination is not present upgradient and upstream of the site at levels

that would be expected to impact the compliance results. The overwhelming majority of the background sample results were "non-detect" at method detection limits. Many of the results for which there were detects appear to be statistical outliers likely resulting from sampling and/or analytical problems.

With minimal to no detected background contamination, we would expect no significant changes in the Acceptable Concentrations. However, the EnviroChem Trust is proposing higher values for Acceptable Concentrations for many compounds. We agree with the proposed increases for Acceptable Concentrations of the following compounds may be suitable because the background sampling shows them to be present in detectable concentrations:

- Methylene chloride – subsurface water
- Chromium VI – surface water
- Cyanide –surface water.

We disagree with the proposed increases for Acceptable Concentrations of the following because the background sampling did not detect measurable concentrations of these compounds above ½ of the CLP quantitation limit after removal of potential outliers.

- Tetrachloroethene; 1,1,2-Trichloroethane; Trichloroethene; Vinyl Chloride; Bis (2-ethylhexyl) phthalate; Antimony and PCBs for subsurface water.
- 1,2-Dichloroethene (total); Arsenic; Lead; Zinc and PCBs for surface water.

In addition, we disagree with the proposed increases indicated above because the data set often consisted primarily of non-detect results with one or two high values. It appears that some of these values are statistical outliers resulting from sampling/ analytical problems and should be eliminated from the data set. The approach of using a mean and standard deviation to statistically develop Acceptable Concentrations assumes a normal distribution of the data. The occasional high value (more than 10 times average) does not represent a normal distribution. As such, outliers should be removed from the data set.

Table 1 discusses the background results for each parameter proposed by the Trust to be modified. The table includes a discussion on why modifications to the Table 3-1 values do not appear warranted with a few exceptions. Methylene chloride, Chromium VI, and Cyanide do appear to have minor levels of contamination above Table 3-1 acceptable concentrations. After removal of statistical outliers for these parameters, a modified acceptable concentration determination as outlined in Revised Exhibit A appears appropriate.

Finally, it was difficult to follow the Trust's calculation of revised acceptable concentrations. The report included the background data and the final results but not the calculations or assumptions used to support the results. CH2M HILL contacted Environ to understand what data was used and what assumptions were made in the analysis. Upon collecting this information, CH2M HILL was able generate the same "acceptable concentrations" as were provided in the report with a few minor exceptions that are discussed in the Specific Comments section below. Based on this analysis, it appears the Trust followed the protocols outlined in the Revised Exhibit A and the EPA approved project plans.

Specific Comments

1. Please include the actual calculation spreadsheets that form basis of the Acceptable Concentrations.
2. We disagree with the proposed Acceptable Concentration of Antimony in part because we cannot duplicate the calculations. CH2M HILL developed Acceptable Concentrations for comparison to this report using the Trust's assumptions. We were unable to obtain equivalent results for antimony using the provided assumptions (37 ug/L versus 46.5 ug/L value in report) and could not identify the discrepancy, as the Trust's calculations were not provided.
3. Methylene chloride is a common laboratory contaminant and was prevalent as a contaminant through out the length of this study. A study wide approach should be taken in assessing the usability of these results (i.e., assess what the average methylene chloride contaminant contamination is and qualify the usability of the methylene chloride results based on that information).
4. The April 1999 surface water sample metal results should only be included in the statistical determination if they are statistically determined not to be outliers. The results are an order of magnitude greater than the average and show poor precision (RPDs greater than 100 percent) with it's duplicate sample.
5. The July 1999 surface water sample VOC results should only be included in the statistical determination if they are statistically determined not to be outliers. The results are an order of magnitude greater than the average and show poor precision (RPDs greater than 100 percent) with it's duplicate sample.
6. The February 2000 surface water sample hexavalent chromium results should only be included in the statistical determination if they are statistically determined not to be outliers. The results are an order of magnitude greater than the average and show poor precision (RPDs greater than 100 percent) with it's duplicate sample.
7. What are the Mass Balance equations presented in Addendum No. 1 used for? If they are not relevant to the determination of the Acceptable Concentrations, they should be deleted from the report.

Table 1
Evaluation of Parameters For Which ECC Trust Proposes Modification
EnviroChem Site - Evaluation of Background Surface Water and Subsurface Water Monitoring Report

	Table 3-1 Acceptable Concentration (ug/L)	ECC Trusts Revised Acceptable Concentrations (ug/L)	# of Samples in Trusts Statistical Determination ^a	Total Non- Detects ^b	Total Detects ^c	Percent of Samples Non- Detect	Concentration Range of Method Detection Limits (ug/L)	Concentration Range of Detects (ug/L)	1/2 CLP Quantification Limit used in Statistical Determination	# of Potential "Outliers" for Detects	Comments	Recommendation
Background Subsurface Water Results (T-5 and S-1)												
Methylene chloride	4.7	156.6	30	21	9	70%	0.5 - 5	0.4 - 310	5	3	Three very high results (190, 130, 310, other detects very low <1). Potential laboratory contamination a major concern.	Remove statistical outliers and evaluate cause of laboratory contamination. After evaluation complete, determine if use of Revised Exhibit A Table 3-1 Acceptable Concentrations appropriate or modification of limit warranted.
Tetrachloroethene	0.69	5	30	30	0	100%	0.5 (most) - 5	N/A	5	0	-	Use Revised Exhibit A Table 3-1 Acceptable Concentration - no detections
1,1,2-Trichloroethane	0.61	5	30	30	0	100%	0.5 (most) - 5	N/A	5	0	-	Use Revised Exhibit A Table 3-1 Acceptable Concentration - no detections
Trichloroethene	5	6.4	30	29	1	97%	0.5 (most) - 5	0.8	5	0	-	Use Revised Exhibit A Table 3-1 Acceptable Concentration - one minor detection
Vinyl chloride	2	5	30	30	0	100%	0.5 (most) - 10	N/A	5	0	-	Use Revised Exhibit A Table 3-1 Acceptable Concentration - no detections
Bis (2-ethylhexyl) phthalate	2.5	7.1	31	26	5	84%	2.5-10	1 - 4	5	0	All detects had concentrations below quantification limit in CLP method of 5 ug/L.	Use Revised Exhibit A Table 3-1 Acceptable Concentration - only 2 detections, detections less than 1/2 CLP quantitation limit
Antimony	14	46.5	31	29	2	94%	0.1 - 100 (100 for 2, most less than 2)	10-19.4	30	0	-	Use Revised Exhibit A Table 3-1 Acceptable Concentration - only 2 detections, detections less than 1/2 CLP quantitation limit
PCBs	0.0045	0.5-1.0 per specific Aroclor	31	31	0	100%	0.47 - 2.0	N/A	0.5	-	-	Use Revised Exhibit A Table 3-1 Acceptable Concentration - no detections
Background Surface Water Results (SW-1)												
1,2-Dicholoroethene (total)	1.85	9.4	19	17	2	89%	all 0.5	11	5	2	The two detects were a sample and its duplicate from one event (July 99). These samples appear to be statistical outliers.	Use Revised Exhibit A Table 3-1 Acceptable Concentration - only two detects which appear to be statistical outliers which should be eliminated.
Arsenic	0.0175	14	19	18	1	95%	1.4 - 5.4	22.9	5	1	The one detect occurred during the April 99 event when most metals were significantly higher than the averages for the other events. The sample may be a statistical outlier.	Use Revised Exhibit A Table 3-1 Acceptable Concentration - only one detect which appears to be a statistical outlier which should be eliminated from the data set.
Chromium VI	11	86	19	15	4	79%	10	15.6 - 119	5	2	Of the detects, there were two potential outliers (119 and 109 ug/L). They were a sample and its duplicate collected on during the February 2000 event.	Two potential outliers exist. The results are an order of magnitude greater than the average. The remaining detects do exceed Table 3-1 value so modification of limit may be warranted.
Lead	10	26.8	19	15	4	79%	0.7 - 2.4	3.9 - 49.7	1.5	1	Of the detects, one potential outlier (49.7 ug/L) occurred during the April 1999 event when most metals were significantly higher than the averages for the other events.	Use Revised Exhibit A Table 3-1 Acceptable Concentration - only one detect which appears to be a statistical outlier which should be eliminated from the data set.
Zinc	47	152	19	11	8	58%	0.4 - 14.2	22.7 - 267	10	1	Of the detects, one potential outlier (267 ug/L) occurred during the April 1999 event when most metals were significantly higher than the averages for the other events.	Use Revised Exhibit A Table 3-1 Acceptable Concentration - one detect which appears to be a statistical outlier which should be eliminated from the data set. The remaining detects are less than the current Table 3-1 acceptable concentration.
Cyanide (total)	5.2	23.9	19	16	3	84%	0.9 -10	10 - 40.5	5	1	A potential outlier was collected during the June 1999 event (40.5 ug/L). It's duplicate was non-detect at 4.7 ug/L method detection limit.	One detect which appears to be a statistical outlier should be eliminated from the data set. Detects do exceed Table 3-1 value so modification of limit may be warranted.
PCBs	0.000079	0.5-1.0 per specific Aroclor	19	19	0	100%	0.47 - 2.0	N/A	0.5	0	-	Use Revised Exhibit A Table 3-1 Acceptable Concentration - no detections

^a Per Environ, the total number of samples used in statistical determination includes results for duplicates. For Subsurface, T-5 and S-1 results were combined. For Stream, SW-1 results were used.

^b Per Environ, Non-Detects are defined as data qualified with a U or B for the purposes of the statistical determination.

^c Per Environ, Detects are defined as unqualified data or data qualified with a J or E for the purposes of the statistical determination.

MEMORANDUM

CH2M HILL Review Comments on Environ's *Background Surface and Subsurface Water Monitoring Report*

EnviroChem Superfund Site in Zionsville, Indiana

TO: Michael McAteer/USEPA Region 5
FROM: Dan MacGregor/CH2M HILL-MKE
Tim Harrison/CH2M HILL-DAY
DATE: February 22, 2001

The purpose of this memorandum is to present CH2M HILL's oversight review comments on the subject document. Environ's report presents the background subsurface and surface water sample results and the EnviroChem Trust's (Trust) approach to amending "Background Acceptable Concentrations" using methodology outlined in Revised Exhibit A of the EnviroChem consent decree.

The subject report presents the Trust's approach to modifying "Applicable Subsurface and Surface Water" concentrations for the site based on the results of "background well and surface water" sampling. The methodology used by the Trust to develop modified applicable concentrations is prescribed in Revised Exhibit A of the Consent Decree (Footnotes 2 and 4 of Table 3-1). This process was included in the Consent Decree to allow the EnviroChem Trust to adjust Acceptable Concentrations to account for local water quality conditions. The concern was that potential upstream/upgradient sources (e.g., Boon County Recycling) might degrade the water quality making it more difficult to clean up EnviroChem to meet Acceptable Concentrations.

The primary steps of the protocol used by the Trustees in the analysis are:

Collect twelve background (i.e., upstream) surface and twelve background (i.e., upgradient) subsurface samples over a period of at least 12 months.

Perform statistical analysis on the analytical results of the twelve samples. The applicable revised concentration is defined as two standard deviations above the calculated mean of the 12 samples.

Table 1 presents the "Acceptable Concentrations" proposed by the EnviroChem Trust compared to the current values from Exhibit A Table 3-1. Note that some of the values increased significantly.

General Comments

The intent of the background sampling provision and statistical determination incorporated in Revised Exhibit A is to account for the potential influence of water quality from potential upgradient/upstream sources. The background sampling, with a few exceptions, shows that background contamination is not present upgradient and upstream of the site at levels that would be expected to impact the compliance results. The overwhelming majority of the background sample results were "non-detect" at method detection limits. Many of the results for which there were detects appear to be statistical outliers likely resulting from sampling and/or analytical problems.

With minimal to no detected background contamination, we would expect no significant changes in the Acceptable Concentrations. However, the EnviroChem Trust is proposing higher values for Acceptable Concentrations for many compounds. We agree with the proposed increases for Acceptable

Concentrations of the following compounds may be suitable because the background sampling shows them to be present in detectable concentrations:

Methylene chloride – subsurface water
Chromium VI – surface water
Cyanide –surface water.

We disagree with the proposed increases for Acceptable Concentrations of the following because the background sampling did not detect measurable concentrations of these compounds above ½ of the CLP quantitation limit after removal of potential outliers.

Tetrachloroethene; 1,1,2-Trichloroethane; Trichloroethene; Vinyl Chloride; Bis (2-ethylhexyl) phthalate; Antimony and PCBs for subsurface water.
1,2-Dichloroethene (total); Arsenic; Lead; Zinc and PCBs for surface water.

In addition, we disagree with the proposed increases indicated above because the data set often consisted primarily of non-detect results with one or two high values. It appears that some of these values are statistical outliers resulting from sampling/analytical problems and should be eliminated from the data set. The approach of using a mean and standard deviation to statistically develop Acceptable Concentrations assumes a normal distribution of the data. The occasional high value (more than 10 times average) does not represent a normal distribution. As such, outliers should be removed from the data set.

Table 1 discusses the background results for each parameter proposed by the Trust to be modified. The table includes a discussion on why modifications to the Table 3-1 values do not appear warranted with a few exceptions. Methylene chloride, Chromium VI, and Cyanide do appear to have minor levels of contamination above Table 3-1 acceptable concentrations. After removal of statistical outliers for these parameters, a modified acceptable concentration determination as outlined in Revised Exhibit A appears appropriate.

Finally, it was difficult to follow the Trust's calculation of revised acceptable concentrations. The report included the background data and the final results but not the calculations or assumptions used to support the results. CH2M HILL contacted Environ to understand what data was used and what assumptions were made in the analysis. Upon collecting this information, CH2M HILL was able to generate the same "acceptable concentrations" as were provided in the report with a few minor exceptions that are discussed in the Specific Comments section below. Based on this analysis, it appears the Trust followed the protocols outlined in the Revised Exhibit A and the EPA approved project plans.

Specific Comments

Please include the actual calculation spreadsheets that form basis of the Acceptable Concentrations.

We disagree with the proposed Acceptable Concentration of Antimony in part because we cannot duplicate the calculations. CH2M HILL developed Acceptable Concentrations for comparison to this report using the Trust's assumptions. We were unable to obtain equivalent results for antimony using the provided assumptions (37 ug/L versus 46.5 ug/L value in report) and could not identify the discrepancy, as the Trust's calculations were not provided.

Methylene chloride is a common laboratory contaminant and was prevalent as a contaminant throughout the length of this study. A study wide approach should be taken in assessing the usability

of these results (i.e., assess what the average methylene chloride contaminant contamination is and qualify the usability of the methylene chloride results based on that information).

The April 1999 surface water sample metal results should only be included in the statistical determination if they are statistically determined not to be outliers. The results are an order of magnitude greater than the average and show poor precision (RPDs greater than 100 percent) with it's duplicate sample.

The July 1999 surface water sample VOC results should only be included in the statistical determination if they are statistically determined not to be outliers. The results are an order of magnitude greater than the average and show poor precision (RPDs greater than 100 percent) with it's duplicate sample.

The February 2000 surface water sample hexavalent chromium results should only be included in the statistical determination if they are statistically determined not to be outliers. The results are an order of magnitude greater than the average and show poor precision (RPDs greater than 100 percent) with it's duplicate sample.

What are the Mass Balance equations presented in Addendum No. 1 used for? If they are not relevant to the determination of the Acceptable Concentrations, they should be deleted from the report.

Table 1 Evaluation of Parameters For Which ECC Trust Pr EnviroChem Site - Evaluation of Background Surface Water and S								
	Table 3-1 Acceptable Concentratio n (ug/L)	ECC Trusts Revised Acceptable Concentration s (ug/L)	# of Samples in Trusts Statistical Determination ^a	Total Non-Detects ^b	Total Detects ^c	Percent of Samples Non-Detect	Concentration Range of Method Detection Limits (ug/L)	Concentratio n Range of Detects (ug/L)
Background Subsurface Water Results (T-5 and S-1)								
Methylene chloride	4.7	156.6	30	21	9	70%	0.5 - 5	0.4 - 310
Tetrachloroethene	0.69	5	30	30	0	100%	0.5 (most) - 5	N/A
1,1,2-Trichloroethane	0.61	5	30	30	0	100%	0.5 (most) - 5	N/A
Trichloroethene	5	6.4	30	29	1	97%	0.5 (most) - 5	0.8
Vinyl chloride	2	5	30	30	0	100%	0.5 (most) - 10	N/A
Bis (2-ethylhexyl) phthalate	2.5	7.1	31	26	5	84%	2.5-10	1 - 4
Antimony	14	46.5	31	29	2	94%	0.1 - 100 (100 for 2, most less than 2)	10-19.4
PCBs	0.0045	0.5-1.0 per specific Aroclor	31	31	0	100%	0.47 - 2.0	N/A
Background Surface Water Results (SW-1)								
1,2-Dichloroethene (total)	1.85	9.4	19	17	2	89%	all 0.5	11
Arsenic	0.0175	14	19	18	1	95%	1.4 - 5.4	22.9
Chromium VI	11	86	19	15	4	79%	10	15.6 - 119
Lead	10	26.8	19	15	4	79%	0.7 - 2.4	3.9 - 49.7

ECC - table 1 - Background Results Summary

Zinc	47	152	19	11	8	58%	0.4 - 14.2	22.7 - 267
Cyanide (total)	5.2	23.9	19	16	3	84%	0.9 - 10	10 - 40.5
PCBs	0.000079	0.5-1.0 per specific Aroclor	19	19	0	100%	0.47 - 2.0	N/A

a Per Environ, the total number of samples used in statistical determination includes results for duplicates. For Subsurface, T-5 and S-1 results were combined. For Stream, SW-1 results were used.

b Per Environ, Non-Detects are defined as data qualified with a U or B for the purposes of the statistical determination.

c Per Environ, Detects are defined as unqualified data or data qualified with a J or E for the purposes of the statistical determination.



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

We make Indiana a cleaner, healthier place to live

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February 19, 2001

Mr. Mike McAteer
U.S. EPA, Region V
77 West Jackson Blvd.
Chicago, Illinois 60604

Dear Mr. McAteer:

Re: Background Surface and Subsurface Water
Monitoring Report, Environmental
Conservation and Chemical Corporation
(ECC)
Zionsville, Indiana, Boone County

Staff of the Indiana Department of Environmental Management (IDEM) have reviewed the Background Surface and Subsurface Water Monitoring Report dated December 22, 2000, prepared by Environ for the Environmental Conservation and Chemical Corporation Superfund site. This report was evaluated based on applicable state and federal guidance documents.

The Background Surface and Subsurface Water Monitoring Report lacks sufficient surface water analytical data. Twelve samples were collected over a two-year period, which were used for background sampling results. These samples were obtained from shallow well T-5, deep well S-1, and surface water location SW-1. Based upon the compound levels noted and the interpretation of Revised Exhibit A, the contractors wish to raise the background levels of several compounds. New subsurface water background concentrations are proposed for methylene chloride, tetrachloroethene, 1,1,2 trichloroethane, trichloroethene, vinyl chloride, bis (2-ethylhexyl) phthalate, and all polychlorinated biphenyl (PCB) compounds. New surface water background concentrations are proposed for 1,2-dichloroethene, chromium VI, lead, zinc, cyanide and all PCB compounds. Several compounds were quantified above the acceptable subsurface water concentrations as presented in Revised Exhibit A, Table 3-1. The comments (below) raise issues that require further discussion and clarification before "Applicable Standards" are replaced by "Acceptable Standards." More documentation is required to demonstrate that the Field Sampling Plan (FSP) has been followed. The Background Surface and Subsurface Water Monitoring Report in question is inadequate and can not be approved until the comments below are addressed to our satisfaction.

General Comments

- The report does not contain enough quality assurance/quality control (QA/QC) documentation to allow for a complete data validation. The data can be used for informational purposes only.
- Even though the FSP states “quality control samples (field blanks, field duplicates, and MS/MSD samples) will be collected...” during each sampling mission, the FSP has not been executed as written. There were no MS/MSD results and there was no indication that samples were ever collected for this specific purpose. Lack of field sheets and Chain of Custody forms make it difficult to ascertain if efforts were made toward adhering to the FSP.
- The proposal to use Applicable Subsurface Water Background Concentrations over the Acceptable Subsurface Water Concentrations to compare with on-site subsurface water is questionable. It is especially questionable for metals’ analyses where there were detectable levels of several metals. The use of Applicable Subsurface Water Background Concentrations leads to less stringent standards for on-site samples. This also remains to be an issue in surface water. Despite the concerns, this change is allowed under Footnotes 2 and 4 of Table 3-1 of Revised Exhibit A.
- The results of several sampling events show that the Applicable Subsurface Water Background Concentrations for methylene chloride, tetrachloroethene, and vinyl chloride are higher than their respective Acceptable Subsurface Water Background Concentrations. Methylene chloride was quantitated at a level (190ppb) that exceeded the Acceptable Subsurface Water Background Concentration (4.7• g• L) and the Applicable Subsurface Water Background Concentration (of 156.6 ppb) in September 1998. It is not clear why elevated levels of methylene chloride were observed in T-5. This result should not be included in the calculation of Applicable Subsurface Water Background Concentrations.
- The Acceptable Subsurface Water Concentration has been raised significantly for methylene chloride. This change is based on a single set of elevated readings from September 1998. It is not appropriate to include the high numbers without some statistical validation of their usefulness. An outlier test must be run on these data
- While Semi Volatile Organic Compounds (SVOCs) do not seem to be an issue in subsurface water, the data provided does not allow for a definitive conclusion in support of this. This is because the reporting limits in most cases were above the Acceptable Subsurface Water Background Concentrations and/or Applicable Subsurface Water Background Concentrations.
- Several metals were quantified above their reporting limit. The results of twelve sampling events show that the Applicable Subsurface Water Background Concentration for antimony increased by a factor of more than three. The elevated reporting limit for antimony (during

Mr. Mike McAteer
Page 3

the August 1998 sampling event) requires an explanation. The elevated reporting limit is the cause for the new Applicable Subsurface Water Background Concentration for antimony.

- The reporting limits for the PCBs did not meet the Acceptable Subsurface Water Background Concentrations nor the Applicable Subsurface Water Background Concentrations (in the earlier stages of the monitoring program). As a result of the elevated reporting limits for various PCBs, the Applicable Subsurface Water Background Concentrations are higher than the Acceptable Subsurface Water Background Concentrations. A discussion about the new Applicable Subsurface Water Background Concentrations for PCBs is necessary.
- As a result of several sampling events, the Applicable Surface Water Background Concentration for 1,2 dichloroethene (total) is higher than the Acceptable Surface Water Background Concentration. It appears as though the change in concentration (by 3 orders of magnitude) is based upon one high sample. This is not a normal distribution. An outlier test should be run on this data. All other samples were non-detect or were detectable both in the sample and the method blank.
- The reporting limits for most SVOCs were above the Applicable Surface Water Background Concentrations. In most cases, the Applicable Surface Water Background Concentrations are more conservative than the Acceptable Surface Water Background Concentrations. In most occasions the compounds were non-detect.

As presented, the above referenced report is not acceptable. These comments need to be addressed in the revised report. If you have any questions, you may contact me Monday through Friday 8 a.m.- 4:30 p.m. at the following address and telephone number:

Indiana Department of Environmental Management
Attn: Warner Myron Waters, OLQ, Federal Programs Section
100 North Senate Avenue
P.O. Box 6015
Indianapolis, Indiana 46206-6015
(317) 234-0355
FAX: (317) 234-0428

Sincerely,



Warner Myron Waters
Federal Programs Section
Office of Land Quality

WMW:sd

cc: Rex Osborn, IDEM